

POPULAR SCIENCE

Nov. 1948

25

Monthly



***“Free-Piston” Power:
Diesel’s Newest Rival?***

PAGE 98

Ray Proctor

IT'S FUN TO BE YOUR

Actual Size
8 1/2 x 5 1/2 in.

and enjoy the home of your dreams!

THE COMPLETE HOME HANDYMAN'S GUIDE

EVERYTHING YOU WANT TO KNOW
ABOUT:

WIRING &
APPLIANCES
PROPERTY
IMPROVEMENTS
PLUMBING
PAINTING
CARPENTRY
& BUILDING

with the aid of the

COMPLETE HOME

Here's How This Book Will
Save You Hundreds of Dollars

THIS amazingly comprehensive volume shows you how to do yourself all of the jobs around the house that have long needed doing—and a lot more you've wished *could* be done. In simple, practical language and pictures it shows you not only how to make your own repairs on your Plumbing, Wiring, Electrical Appliances, Masonry, Plaster, Heating System, Furniture, etc., but also how to *make valuable improvements* in your home, from a new closet to a whole new roof—from a new floor to a whole new modern kitchen.

No longer need today's high labor costs keep you from having the kind of home you'll be proud of—attractive, smooth-running, free from hazards, and equipped with every comfort! This COMPLETE GUIDE makes even the most unfamiliar job easy to do—and *fun* to do! You not only save time and money, you also enjoy the thrill of watching your home acquire new luxury, comfort and value.

**More than 1,000
"How To Do It" Illustrations!
300,000 Words! • 512 Pages**

Here is Just a Partial List of the Hundreds of
"How-To-Do-It" Articles in this One Book:

USE CONSTRUCTION AND MATERIALS

How to Build a Foundation
Types of Girders and Sills
Joists and Floor Joists
Lumbering Materials—
Sphal, Asphalt, Asbestos,
Aluminum, Wood
Shingles
Concrete forms, mixing
to Make All Types
of Tinsmith Repairs

INTERIOR REPAIRS

Repairing Creaky Floors
Painting and Storing
Screens
Painting Windows—sash
ord, windowpanes;
loosening stuck
indows
Plum-laying, patching
ng Loose Tiles
ding China,
Metal Utensils
Painting Door Locks,
inges
Fighting Equipment
ment into Game Room
ding Partitions
ng Hardwood
looring, etc.

DECORATING

papering
ning Wallpaper
ning Painted Walls
iring Plaster

Scraping Floors
Refinishing Floors
Care of Carpets
and Draperies

PAINTS AND PAINTING

Types of Paint Brushes
Types of Paint
Varnishes, Enamels
Lacquers, Shellac
Calcimine
Paint Thinners
Mixing Paints
Surface Preparation
Removing Paint
Painting a New Surface
Porch Floors and Steps
Painting Metal
Preparing Plaster
Fillers, Staining, etc.



(Above) A simple little
trick like knotting the wire
inside extension plugs can
save you severe burns,
blown-out fuses, and fire
hazards. Protect your home
and family with the advice
in this book!

ELECTRICITY IN THE HOME

Approved Electrical
Equipment
Home Generators
Fuse Boxes and Fuses
Appliance and Extension
Cords
Replacing Fixture Sockets
Electric Motors
Home Signalling Systems
Burglar Alarms, etc.

HEATING THE HOUSE

Chimneys
Coal Furnaces, Oil
Burners
Automatic Draft
Regulators
Thermostats
Fuel Economy
Warm Air Heating
Systems
Steam Heating Systems
Cleaning, Adjusting
Radiators
Noise in Steam System



Hot Water Heating System
Repacking Leaky Valves
Cleaning Boilers
Cleaning the Furnace
How to Insulate Your
House
How to Build and Install
Storm Windows
Efficient Weather
Stripping, etc.

PLUMBING

Water Supply
Cause of Dirty Water
Repairing Sewage System
Cesspools, Septic Tanks
Stopped Up Sewer Pipes
Stopped Up Drains
Chemical Drain Cleaners
Plumbing Traps
Noisy Plumbing
Repairing Hot Water Tanks
Thawing Frozen Pipes
Water Softening
Equipment
Repairing Faucets, Flush
Tanks, Leaky Pipes, etc.

EXTERIOR REPAIRS

Waterproofing Damp
Basements
Waterproofing Masonry
Walls
Repairing Cracks in
Foundation, Stucco
Walls

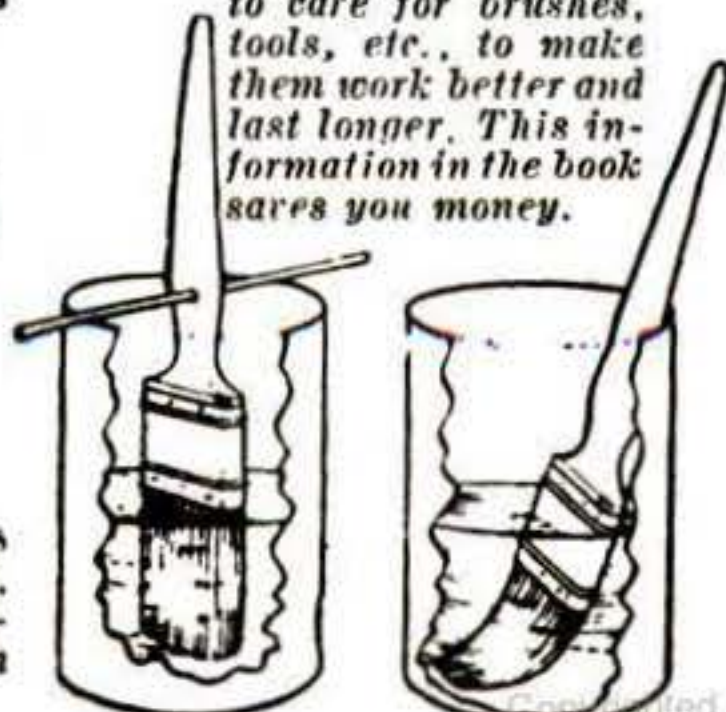
(Left) You SEE diagrams
that help you locate and,
with little effort, fix plumbing
noises, leaks, and drain
stoppages.

Repairing Brick Walls
Repairing Leaky Roofs
Caulking Seams
Gutters and Downspouts
Ridding the House of
Termites, etc.

YOUR GARDEN

Building Garden Paths
Building Garden Pool
Care and Use of Garden
Tools
Cold Frames
Rustic Screens and Arches
Building an Outdoor Fire-
place
Erecting Garage, Summer
Guest House or Play
House in Garden, etc.

Learn the correct way
to care for brushes,
tools, etc., to make
them work better and
last longer. This in-
formation in the book
saves you money.



OWN HANDYMAN!

Here's Everything You Need to Know to Do Your Own Repairing, Beautifying, Modernizing, Converting! The A to Z of CARPENTRY, PLUMBING, PAINTING, DECORATING, WIRING AND APPLIANCES, MASONRY, FURNITURE REPAIR, HEATING SYSTEMS—all in one book!



HANDYMAN'S GUIDE

Make a New Kitchen, Game Room or Bathroom! Build an Extra Apartment and Live Rent-Free!

Here's 1,001 methods to help make your house more valuable—and add hundreds, even thousands of dollars to its value. Need new closet space? Want to eliminate that dangerous draft in the baby's room? Redecorate sister's room? Build a garden walk? Lay a new linoleum floor? Get better winter heat for less money?

Want to convert your basement or attic into an extra apartment and give yourself a rent income that may well offset a good part or all of your taxes, mortgage payments and other expenses?

You can make these improvements yourself, at surprisingly little cost, with the help of *The Complete Home Handyman's Guide*.

Easy Step-by-Step Instructions in Clear Pictures and Simple Text!

This book assumes no mechanical knowledge or skill on your part. It starts from the very beginning, explaining how to select and use tools and materials. It gives you detailed information every step of the way, from repairing a lamp or iron to installing a complete wiring system; from repairing a chair-leg to rebuilding your upholstery; from buying a paintbrush to repainting the house inside and out. More than 1,000 ILLUSTRATIONS, accurately and explicitly drawn, make the complete instructions easy to follow. This is the *number one* book for your home. It will repay its astonishingly small cost many times over within a short time!

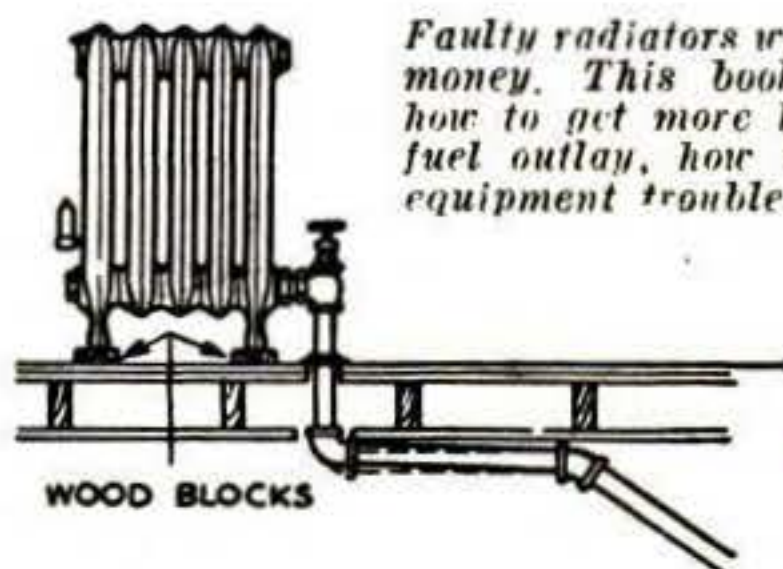


FURNITURE CARE AND REPAIR

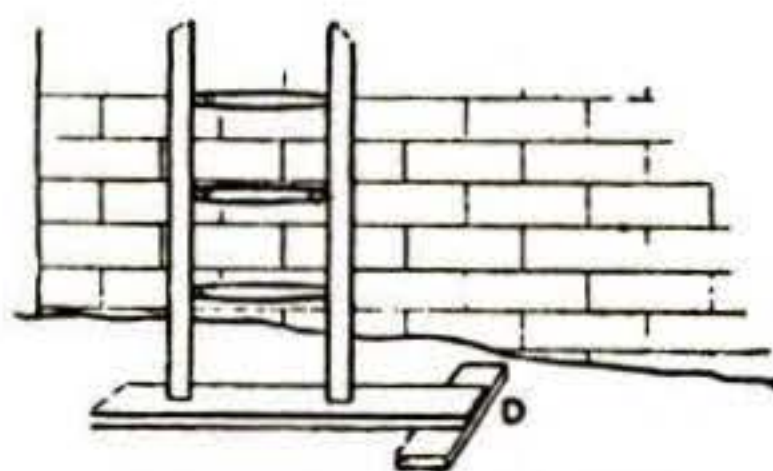
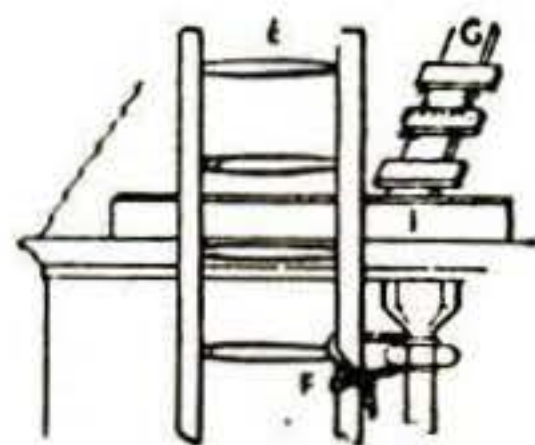
Upholstery of Chairs, Sofas, etc.
Replacing Worn Springs
Strengthening Frame
Furniture Upkeep, Cleaning, Removing Water Stains, Marks, Scratches, etc.
Loose Joints
Broken Chairs
Polishes and Polishing
Staining, etc.

OUR TOOL KIT

Equipping Your Workshop
Selecting the Right Tools
Correct Use of Tools
Care of Tools
How to Sharpen Tools
Sandpapers, Glues, etc.
Soldering Equipment
and Technique

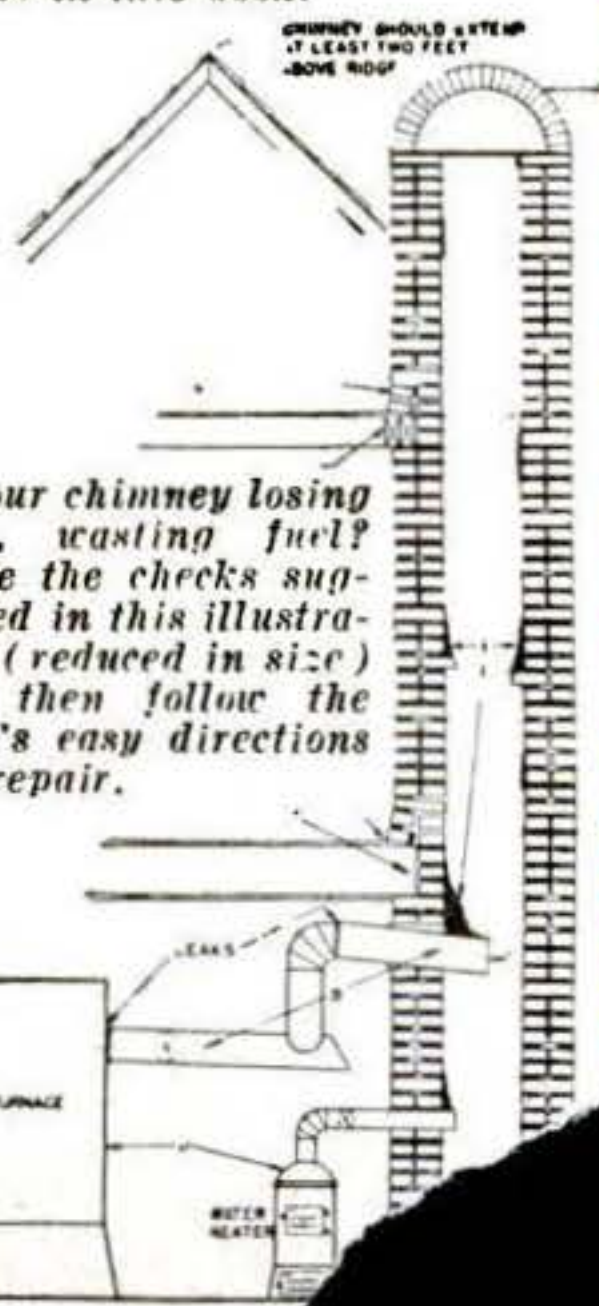


Faulty radiators waste heat and money. This book shows you how to get more heat for your fuel outlay, how to keep your equipment trouble-free.



Avoid hazards. This illustration shows how to secure a ladder when you make roof repairs. Complete instructions for repairing walls, foundations, gutters, shingles, etc.

(Left) Furniture upholstery and repair is a fascinating and money-saving hobby when you follow the easy step-by-step instructions in this book.



Is your chimney losing heat, wasting fuel? Make the checks suggested in this illustration (reduced in size) and then follow the book's easy directions for repair.

How to equip a workshop, how to use all types of tools, how to use sandpaper and glues—all are fully covered in this "show-me-how" volume.

Yours for a Week's Free Trial!

Think of getting in this one big 512-page volume all the practical information you need to do a good professional-looking job of repairing or improving any part of your home—from cellar to chimney-top! Think of getting all this—not for the \$18.00 or \$24.00 you would expect to pay for 6 or 8 books covering all these fields—but for the miracle price, only \$3.95! But don't take our word for this big value. Examine FREE, at risk and expense, a copy of the *Complete Home Handyman's Guide*. Just mail the coupon below. When the book arrives, test it a full week FREE! If you don't agree it's the best money-saving buy ever, return it without further obligation. If you keep it, pay the small price in small monthly installments. But act at once. Our limited printing is inadequate to meet the demand.

© 1948 Wm. H. Wise & Co., Inc.
50 W. 47th St., New York 19, N. Y.

MAIL THIS FREE-TRIAL COUPON!

Wm. H. Wise & Co., Inc., 50 West 47th Street, New York 19, N. Y.
Without obligation to me, rush me immediately, for Free Examination, a copy of the big new 512-page "COMPLETE HOME HANDYMAN'S GUIDE", bound in sturdy rich Novelex and profusely illustrated with more than 1,000 "How-to-do-it" pictures. After a full week's free trial, I will either return the book promptly and owe you nothing, or I will keep it and remit only \$1 monthly until the amazingly low price of only \$3.95 plus a few cents postage, is paid.

☐ Check here for De Luxe Edition at only \$1 extra.

SAVE CHARGES ON 3 LB. SHIPMENT. Send only \$3.95 with this coupon and we will stand all shipping charges. Same return & refund privilege. (\$4.95 for De Luxe.)

MR.
MRS.
MISS

(Print Plainly in Block Letters)

DO NOT WRITE IN BOXES

153

8011

STATE.....
Cover "PRACTICAL AND TECHNICAL" for FREE trial, 640 pages, covers Autos, Mechanical, Painting, Metallurgy, Chemistry and Television, etc.

Copyrighted material

FOUNDED 1872



VOL. 153: NO. 5

POPULAR SCIENCE

MECHANICS AND HANDICRAFT

Monthly

EDITOR: Perry Githens

MANAGING EDITORS: Fred O. Newman, Volta Torrey. ART EDITOR: Howard C. Jensen.

MECHANICS & HANDICRAFT EDITOR: Harry Walton.

ASSISTANT MANAGING EDITORS: Hartley E. Howe, Frank Rowsome, Jr.

ASSOCIATE EDITORS: Howard Allaway, Alden P. Armagnac, Devon Francis, Robert Gorman, Sheldon Gallagher, Herbert Johansen, Martin Mann, Denis Sneigr, Robert P. Stevenson.

STAFF PHOTOGRAPHERS: W. W. Morris (Chief), Hubert Luckett, Orlando Guerra (Darkroom).

WESTERN EDITOR: Andrew R. Boone (Los Angeles).

ART DIRECTOR: Harry Samuels. ART ASSOCIATES: Herbert Anthony, Eric Karminski, Jr., Richard Meyer, Saverio Rada, Frances Cooper (Production).

EDITORIAL ASSISTANTS: Mae G. Dyer (Assistant to the Editor), Julia Charnif, Carol Ennis, Charlotte Korch, Georgette Sparks, Ruth Westphal.

WASHINGTON CORRESPONDENT: John F. Loosbrock

PUBLISHER: Godfrey Hammond

TABLE OF CONTENTS FOR NOVEMBER, 1948

Cover Painting by Ray Pioch

Science News

Controlling Atomic Gases.....	108
You're Tougher Than You Think.....	147
Squawkbox for Seaquakes.....	152
Wet "Wind" Tunnel Tests Torpedoes....	166

Science at Work

Stacking Up with the Best.....	97
Industry Plans to Put Atom to Work.....	138
Navy Develops New 3-in. AA Gun.....	139
Crane Gets Safe Ladder.....	151
Lab-on-Wheels Speeds Rocket Tests.....	153
Whole House Cast Like Toy.....	164

PS Features

New Iron Horses Don't Drink Water....	98
Unrolling Logs for Plywood.....	134
Dolls Die for Crime Doctors.....	143
New Machine Simplifies Steel Making....	156
Old Skeletons Fill New Jobs.....	160
New Furnaces Lick Fuel Shortages.....	198
Blueprints in Plastic.....	234
Playing with Centrifugal Force.....	236

Aviation

Do You Know Your New Air Force?.....	118
British Outfly Sound.....	125
Life-Saving Lightning.....	126
Aero Lab is Craftsman's Dream.....	131
Homemade Slingshot Launches Plane....	146
What's New in Aviation.....	154

Automobiles

New Car Weighs 600 lb.....	111
New Nash Swallows Its Wheels.....	114
Fruit Goes by Trailer.....	121
Coin in Slot Parks Car.....	122
Station Wagon Glows at Night.....	148
New Brake Sheds Heat.....	168
Valve Cap Shows Pressure.....	169
Hints from the Model Garage.....	170
Fenders Lift Off.....	172
New Indians Have Overhead Valves.....	173
Gus Adds Two and Two.....	174
\$250 Produces a Dream Car.....	178

Inventions

Adjustable Coat Speeds Tailoring.....	105
New Ideas from the Inventors.....	106
Mechanical Finger for Microscope.....	120
Concrete Pipe Is Tough.....	142
Mask Sharpens His Aim.....	148
Hangs 3-Piece Suit in 1.....	151

New Products

Mattress Tailors Bed to Sleeper.....	130
New Toys.....	140
Machine Aids Timbering.....	142
Typewriter Slips on Purpose.....	150
Needle Threaders Save Eyesight.....	159
Folding Cribs Ease Traveling.....	159
Furniture Maker Uses Barrels.....	187
Flashlight Run by Magneto.....	214

Continued on page 4

® This mark in text indicates Trade Name.

Popular Science Monthly is published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, President and Treasurer; R. C. Wilson, Raymond J. Brown, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, re-entered as second-class matter July 26, 1948, at the Post Office in New York, N. Y., under the act of March 3, 1879; additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A. Copyright, 1948, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada, \$3.00 (2 years, \$5.50; 3 years, \$7.50); foreign countries \$1 per year extra. Please notify us of change of address four weeks in advance of the next publication date. Be sure to give both old and new addresses including zone numbers. Vol. 153: No. 5.

FREE
7-DAY TRIAL

HOW TO BUILD A BETTER HOME

JUST MAIL COUPON

If You Are Undecided Whether You Should Build or Buy—
If You Are Leery of 'Cheap' Building, Shoddy Work or Poor Design—
If You Are Fed-Up With DREAMING About Your New House and
Want to Get STARTED—Then This Will Prove a GOD-SEND to YOU!

HERE is the answer to how to build your own home. Here is the WORKS—how to plan, how to construct, how to supervise—simply, clearly explained step-by-step. Jam-packed with everything you need to know about building your own home yourself, or having a contractor build it for you. Hundreds of clear-cut, complete diagrams. You will be able to build a home that will amaze everyone!

Everything You Need to Know to Get Started

Some of the Things This Book Explains:

Here at your fingertips are the secrets that produce fine small homes—completely revealed in this great—easy—reference book!

- HOW TO decide on home ownership.
- HOW TO fit your house to your income.
- HOW TO choose among types (pre-fabs, bungalows, one story, two story).
- HOW TO get started.
- HOW TO select professional services; real estate dealer; bank; attorney; contractor; insurance broker.
- HOW TO select a good building lot.
- HOW TO finance your home.
- HOW TO draw contracts.
- HOW TO use comparative costs in deciding—size, plan, design, material, finish and equipment.
- HOW TO prevent termites, cracks, leaks, decay and corrosion.
- HOW TO locate house on lot.
- HOW TO excavate.
- HOW TO get good masonry construction—footings, piers, basement, walls, chimneys and fireplaces, walks, driveways and terraces.
- HOW TO waterproof.
- HOW TO select good lumber.
- HOW TO frame.
- HOW TO roof.
- HOW TO select and install heating.
- HOW TO plan and install electric wiring.
- HOW TO insulate.
- HOW TO install plumbing.
- HOW TO lath, tile and plaster.
- HOW TO get and install good millwork and finished carpentry.
- HOW TO specify sheet metal work.
- HOW TO paint and finish.
- HOW TO grade.

This complete book contains over 500 "How to do it" drawings and illustrations. It explains what you should do and what you should not do. It covers every phase of home ownership. No detail is missing. For example, it lists 46 things you should consider before you even buy a lot.

Hundreds of references to publications on related subjects are given, such as home equipment, landscaping, stock plans, decorating. Over one hundred of these publications may be had free.

Nothing Like It Before! One Simple Fact May Repay You a HUNDRED Times its Small Cost. A Book You Will Refer to for Years to Come!

Provides you with all the facts. Whether you are going to spend \$2,000 or \$20,000 for your home—whether you are going to employ an architect or use stock plans—or whether you are going to buy a house instead of building, this book will help you. Before you build you should know the difference between good and bad construction. Now—in these days of shortages—just one of the hundreds of diagrams can save you thousands of dollars. You will get a thrill out of being "in the know," being "wise" to the game, being able to talk to building people in their own language. You'll be respected, admired, and get better workmanship on your home. You'll get a feeling of pride as your friends admire the home being built. Here, in one clear-cut volume is all the basic information you will need!

Where to Begin

No matter what your building problem may be, you will find the answer in this amazing volume. No truth is kept from you. You are told the disadvantages of home ownership as well as the advantages. You are told of the precautions you will need to safeguard your investment. You are shown how to select a lending institution, a lawyer, a real estate dealer, an architect, a contractor. Your questions on methods of buying are fully answered. Just a quick glance at the partial table of contents on this page will show you some of the thousands of facts on building which this complete volume contains. Those who have bought a copy write that they have never seen so thorough a work on this subject for any price, anywhere!

Hundreds of Construction Details

Explains all the "mysteries" of permits, contract forms, and construction. Tells you how to build the right kind of home, how to avoid "cheap," cracker-box construction, how to get a house that is suitably located, beautiful to look at and priced within your means—a house you will be proud to call your home.

How to Build—from Plans to Paint

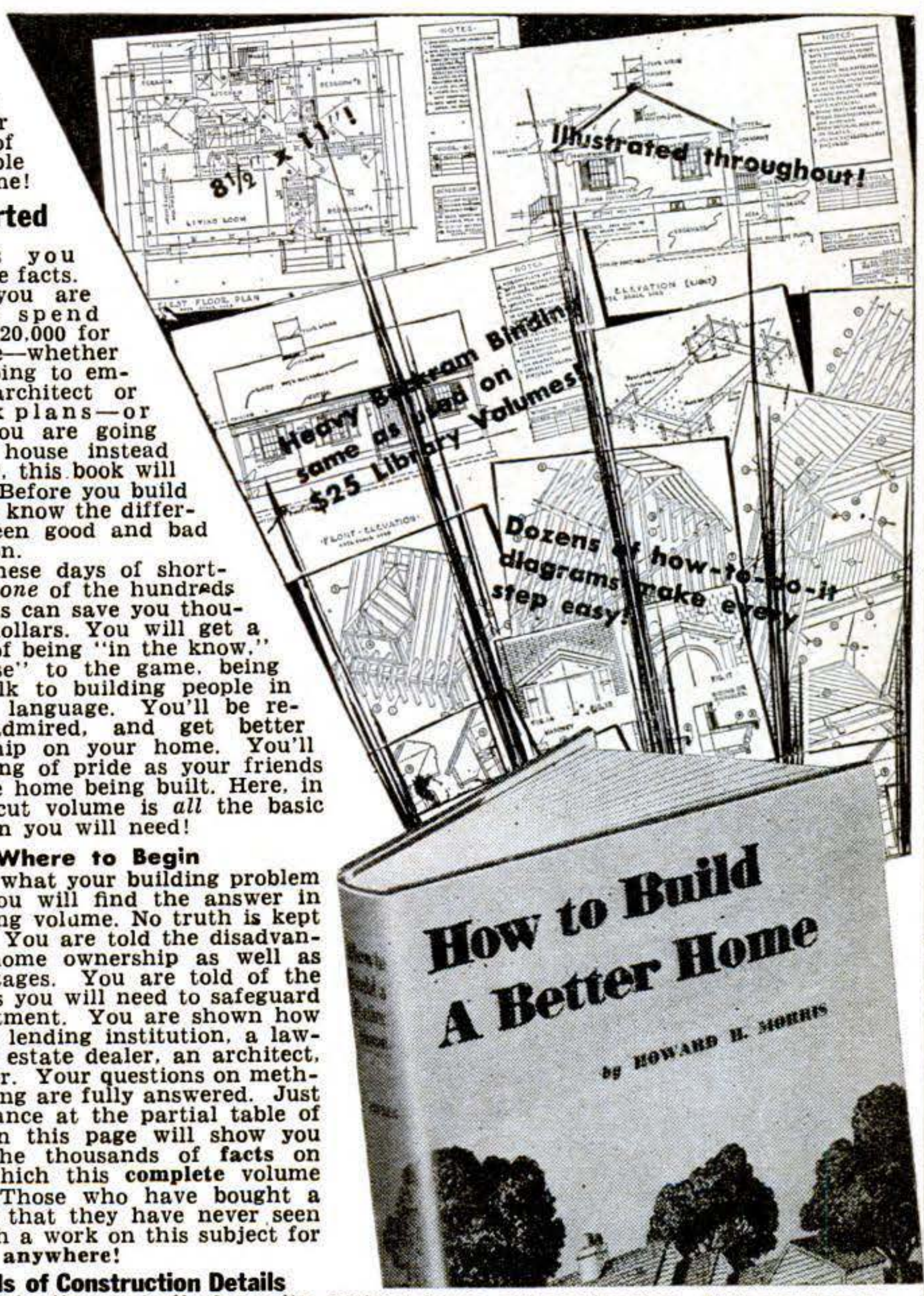
Not one important step is missing from this volume. See for yourself. Every conceivable thing you would want to know about building will be found in this wonderful new book!

SEND NO MONEY
Examine It for 7 Days
FREE!

You don't even risk a cent to examine "How to Build a Better Home." Just mail coupon. Study book for a week. FREE! See how easy it is to supervise or build a better home, YOURSELF—even if you know nothing about construction NOW! Then, if you are THRILLED with this amazing volume, send only \$3.98 (plus postage). If you are not thrilled, return book and pay nothing! This is your chance to build not just a house, but a BETTER HOME! Mail FREE EXAMINATION COUPON NOW, to The Westport Publishing Company, Dept. PS-11, Westport, Conn.

Read What Great Building Authorities Say About This Amazing Book (names on request)

Excerpts from typical letters of praise:
"... the best book on the subject that has been published to date." "was thrilled" "valuable information for the new home-builder."
"... an excellent piece of work" "helped us decide our building plans" "well worth price."
"... very much impressed" "an excellent reference book."
"... the writing is clear and compact... complete and unbiased information."
"... most interesting and complete." "You are to be congratulated. Contains more information than any volume seen... Everything you said."
"... One of the best works of its kind I have ever seen. Send me 10 more for presents."
And from an amateur:
"From this book, I did the plans myself! Had never done anything like it before... A neighboring architect said I was an up-and-coming designer and he found not one fault with my plans... The building is now finished and everyone says it's beautiful!... I saved \$1900!"



FREE Examination Coupon—Mail Now

The Westport Publishing Company,
"Books of Merit," Dept. PS-11, Westport, Conn.
Please send me, for one week's FREE EXAMINATION, a copy of "How to Build a Better Home." After 7 days I will either return this book and owe you nothing, or I will keep it and send you \$3.98 (plus shipping charges).

Name.....Age.....
(please print)

Address.....

City & Zone.....State.....

☐ Save postage. Check here if you enclose full payment of \$3.98 (check or money order) WITH coupon. WE will then pay shipping charges. If not thrilled with book, return it with order and we will refund your money by AIR MAIL! Foreign Orders \$4.50 Cash with order.



Satisfied with my JOB and PAY? NOT ME!!

"Some day I'll really get a break and go right on to the top." That's wishful thinking.

You know that the "breaks" go to the man or woman who is prepared to take advantage of them—to the person who can fill the better job and is worth more money. He makes the "breaks" instead of waiting for them.

You can influence your own future by preparing now for the step forward—so that openings come because you are equipped for them—not as the result of luck.

Why not take the road that thousands of ambitious men and women have taken to help them to better jobs and more money.

Prepare now. Send the coupon below—check the business field of your choice and we'll send you without obligation our FREE 48-page book describing the opportunities and complete information on that field—plus "Ten Years' Promotion in One"—a book which has helped many men.

Send the coupon Now. It may be the turning point in your life to that better job and more money.

LASALLE Extension University
A Correspondence Institution
Dept. 1183-R Chicago 5, Ill.

LASALLE Extension University A Correspondence Institution

417 S. Dearborn St., Dept. 1183-R, Chicago 5, Ill.

I want to make my own "breaks" by preparing for a better job. Send free 48-page book on the subject I have checked.

- | | |
|--|--|
| ☐ Higher Accountancy | ☐ Salesmanship |
| ☐ C.P.A. Coaching | ☐ Traffic Management |
| ☐ Bookkeeping | ☐ Foremanship |
| ☐ Law: LL.B. Degree | ☐ Industrial Management |
| ☐ Business Management | ☐ Stenotypy (Machine Shorthand) |

Name Age

Address

City Zone State

Photography

Lensless Camera for Microscope.....	120
Fireflies Light Photo.....	124
It's Done with Mirrors.....	130
How to Photograph Glass.....	216

Mechanics & Shopwork

New Cabinet Built Around Old Radio....	184
Toy Train Has Ratchet Drive.....	190
Turntable Swings Radio for Tuning.....	193
Model Hot-Air Engine.....	194
Grooving with Woodworking Machine..	202
Sharpening Jointer Blades.....	205
Tank for Glo-Plug Fuel.....	214
Windshield Wiper Makes Engine.....	226
Oil Lengthens Saw-Blade Life.....	227
Test Tank Made from Tire.....	227
Scale Support Hinged to Wall.....	238
Harrow Cut from Auto Chassis.....	239
Electric Shop Oven Cures Plastic.....	240

Home Mechanics & Handicraft

Plastic Box Framed in Copper.....	182
Plank Cut to Size Fits Floor.....	187
Roll-Front Cutlery Cabinet.....	189
Leather-Covered Smoking Set.....	197
How to Use Copper Tubing.....	206
Gateless Gate Stops Animals.....	226
Tree Conceals Key.....	227
Sweetening the Sour Notes.....	228
Homemade Coal Conveyer.....	235
Many Locks Hold Public Gate.....	238
Gluewell Keeps Bench Neat.....	239
Slit Hose Forms Glue Brush.....	240

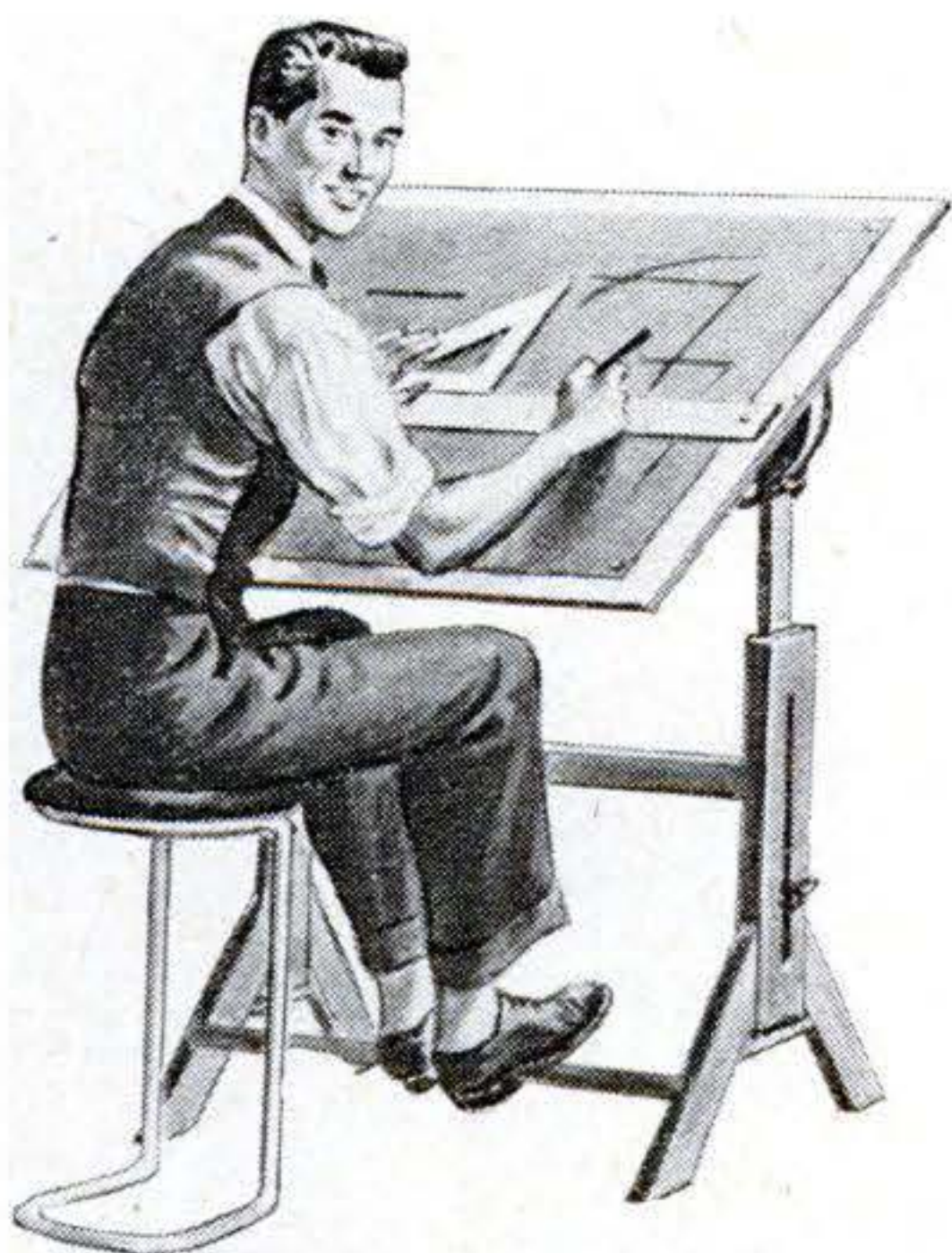
Radio & Electricity

Guard Rail Lights Road.....	111
Under Your Hat.....	117
Truck Totes 74-Ton Shaft.....	121
Freezer Gets Heater.....	130
Trick Refrigerator Talks.....	149
Radio Hints for the Beginner.....	220
Wireless Mike Puts You on the Air.....	224
Sounding Rod Is Electrified.....	226
Plug Connects Automatically.....	227

Departments

Letters	16
Voice of Science.....	95
March of Science.....	112
I'd Like to See Them Make.....	158
What's Your Ingenuity Quotient?.....	188
New Shop Ideas.....	210
Keeping the Home Shipshape.....	212
Photo Ideas & Equipment.....	215
New Tools.....	232
Craftsmen Show Their Work.....	233
Aids to Modern Living.....	318
To: Reader—From: Editor.....	322

THERE'S BIG MONEY IN DRAFTING



JOIN the career-minded men who are *drafting* successful futures for themselves. Design your own program for self-improvement. International Correspondence Schools can show you how.

I. C. S. Courses in Mechanical or Architectural Drafting have helped many hundreds of ambitious young men get started in this rewarding field—have helped pave the way for promotions and salary increases.

Each of the 400 I. C. S. Courses (covering business and technical subjects) is prepared by outstanding authorities with *practical* knowledge of their subject. Each is revised to meet up-to-the-minute developments.

You want to be counted among tomorrow's leaders. You want the rewards that come with *training*. Then get started by clipping and mailing the coupon *today*! It's your application for a share in the future.

INTERNATIONAL CORRESPONDENCE SCHOOLS



BOX 7618-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Air Conditioning and Plumbing Courses

- ☐ Air Conditioning
- ☐ Heating
- ☐ Refrigeration
- ☐ Plumbing
- ☐ Steam Fitting

Chemistry Courses

- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Chemistry, Mfg. Iron & Steel
- ☐ Petroleum Refining
- ☐ Pulp and Paper Making
- ☐ Plastics

Civil Engineering, Architectural and Mining Courses

- ☐ Architecture
- ☐ Architectural Drafting
- ☐ Bridge and Building Foreman
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Coal Mining
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Lumber Dealer
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting

- ☐ Structural Engineering
- ☐ Surveying and Mapping
- ☐ Communications Courses
- ☐ Electronics
- ☐ Practical Telephony
- ☐ Radio, General
- ☐ Radio Operating
- ☐ Radio Servicing
- ☐ Telegraph Engineering

Electrical Courses

- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician

Internal Combustion Engines Courses

- ☐ Auto Technician
- ☐ Diesel-Electric
- ☐ Diesel Engines
- ☐ Aviation
- ☐ Gas Engines

Mechanical Courses

- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting
- ☐ Forging
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Flight Engineer
- ☐ Foundry Work

- ☐ Industrial Metallurgy
- ☐ Machine Shop
- ☐ Mechanical Drafting
- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker

- ☐ Ship Drafting
- ☐ Tool Designing
- ☐ Welding Engineering
- ☐ Welding—Gas and Electric
- ☐ Ship Fitting
- ☐ Toolmaking

Railroad Courses

- ☐ Air Brake
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Locomotive Machinist
- ☐ Railroad Section Foreman
- ☐ Car Inspector

Steam Engineering Courses

- ☐ Boilermaking
- ☐ Combustion Engineering
- ☐ Engine Running
- ☐ Marine Engineering
- ☐ Steam Electric
- ☐ Steam Engr.

Textile Courses

- ☐ Cotton Manufacturing
- ☐ Loom Fixing
- ☐ Textile Designing
- ☐ Woolen Manufacturing
- ☐ Rayon Weaving

Business and Academic Courses

- ☐ Accounting
- ☐ Bookkeeping
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Certified Public Accounting
- ☐ Commercial
- ☐ Cost Accounting
- ☐ Federal Tax
- ☐ Foremanship
- ☐ Good English
- ☐ Higher Mathematics
- ☐ Motor Traffic
- ☐ Retailing
- ☐ Retail Store Management
- ☐ Salesmanship
- ☐ Sign Lettering
- ☐ Spanish
- ☐ Traffic Management
- ☐ Advertising
- ☐ First Year College
- ☐ French
- ☐ High School
- ☐ Postal Civil Service
- ☐ Secretarial
- ☐ Stenography

Name _____ Age _____ Home Address _____

City _____ State _____ Working Hours _____ A.M. to _____ P.M.

Present Position _____ Employed by _____

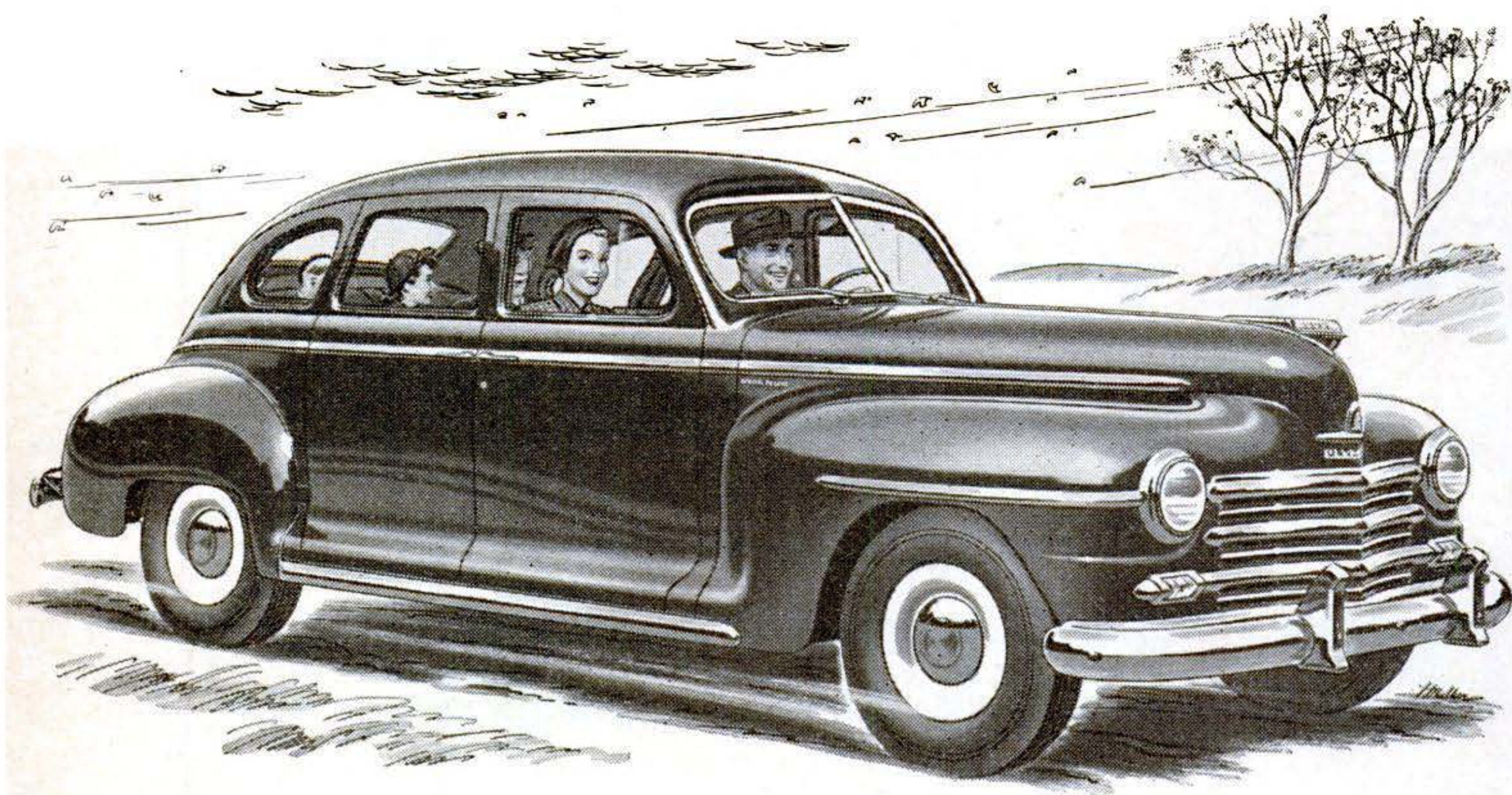
Special tuition rates to members of the Armed Forces. Enrollment under G.I. Bill and P.L. 16 approved for World War II Veterans.
Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Who makes the Plymouth so safe?

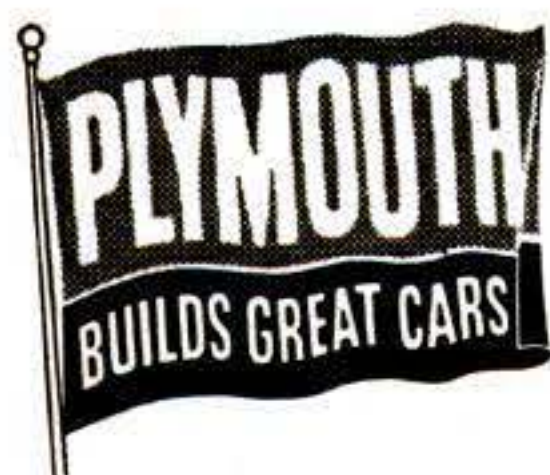


YOU DO :

When you drive carefully—observe all traffic laws—keep your car in good running condition—you make the most important contribution to your Plymouth's safety.



WE DO :



**Plymouth Builds Great Cars . . .
Good Service Keeps Them Great.**

Your nearby Plymouth dealer will provide the service and factory-engineered parts to keep your present car in good condition while you're waiting for your new Plymouth.

PLYMOUTH Division of
CHRYSLER CORPORATION,
Detroit 31, Michigan.

Built into your Plymouth is a combination of safety features you find in no other car in the lowest-priced field.

Plymouth gives you *Super-Cushion Tires* as standard equipment at no extra cost. These bigger, softer tires run cooler, are less likely to blow out. If the unexpected should happen—even at high speeds—Plymouth's *Safety-Rim Wheels* enable you to slow to a sure, safe stop.

Plymouth also gives you quicker, smoother stops with *Safe-Guard Hydraulic Brakes*. Plymouth's *Safety-Steel Body*—welded into a rugged, single unit—offers added protection.

Even in minor details, Plymouth engineers keep your safety first. The improved *Safety-Signal Speedometer* helps you maintain safe speeds for night driving. The running boards are floor-level so you can't trip. There are safety catches on the rear doors which can be set to guard against accidental opening. The luggage compartment lid lifts and lowers with finger-touch ease and is so counter-balanced it *can't* fall.

These features—and many more like them—are the reasons why in safety, too, *there's a lot of difference in low-priced cars—and it's Plymouth that makes the difference!*

It's Amazing! It's Sensational! It's Exclusive!

"The New Arthur Murray Way"

makes learning to dance easier than ever!

Even if you never danced before you can become a popular partner in a fraction of the usual time "The New Arthur Murray Way"

Take Arthur Murray's short-cut to good times. Find the self-confidence and popularity you've always wanted.

Only a few hours at any Arthur Murray Studio will transform you into an expert dancer. His unique methods make learning easy and fast! The key to all new dances is Arthur Murray's basic discovery — the

"First Step to Popularity." Like magic you find yourself leading or following a smart new Fox Trot, Rumba, Samba. You can actually go out dancing after one hour even if you've never danced before.

Stop Passing Up Good Times

Only at an Arthur Murray Studio can you get that wonder-working combination of his new, improved exclusive methods and the trained skill of his teachers. You'll be a joy to dance with, a pleasure to watch. Get a dance analysis *free* at any Arthur Murray Studio. Come in or phone *now*.

PROOF You can dance after 1 lesson!

See how quickly you can learn to dance "The New Arthur Murray Way." Send for the "Murray-Go-Round" today! It contains instructions on the Fox Trot, Waltz and all dances. Consult your telephone directory and **MAIL THIS COUPON TO YOUR NEAREST ARTHUR MURRAY STUDIO**; or send it to Arthur Murray (Studio 10), 11 East 43rd St., New York 17, N. Y.

Copr. 1948—Arthur Murray Inc.

ONLY **25¢** 44 PAGE DANCE MAGAZINE

ARTHUR MURRAY

DANCE STUDIOS FROM COAST-TO-COAST

Visit the one nearest you for
a **FREE** dance analysis

ARTHUR MURRAY STUDIOS: Please send me your magazine, "Murray-Go-Round," 44 pages of pictures and instructions on the latest ballroom dances, Fox Trot, Waltz, Rumba, Samba, etc. I enclose 25c.

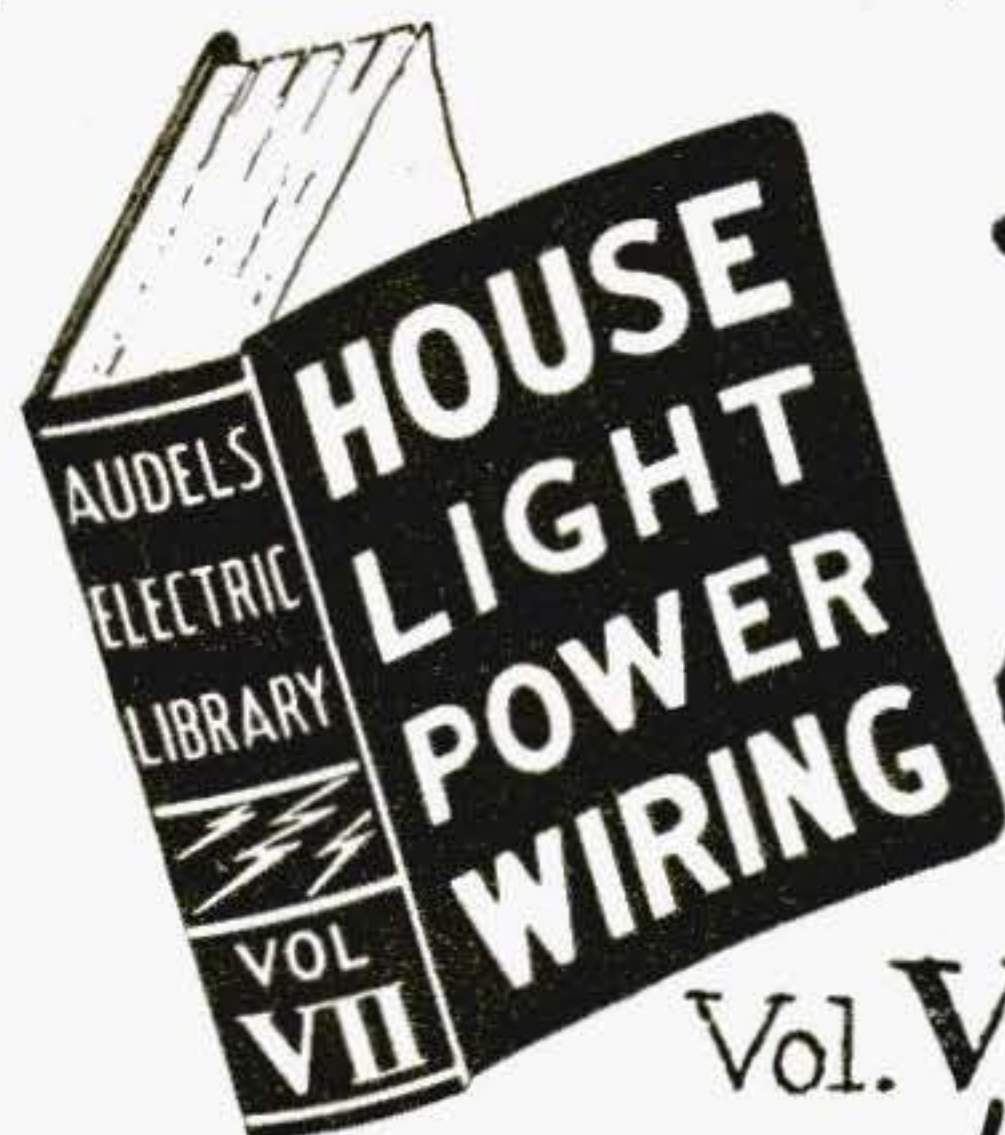
NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

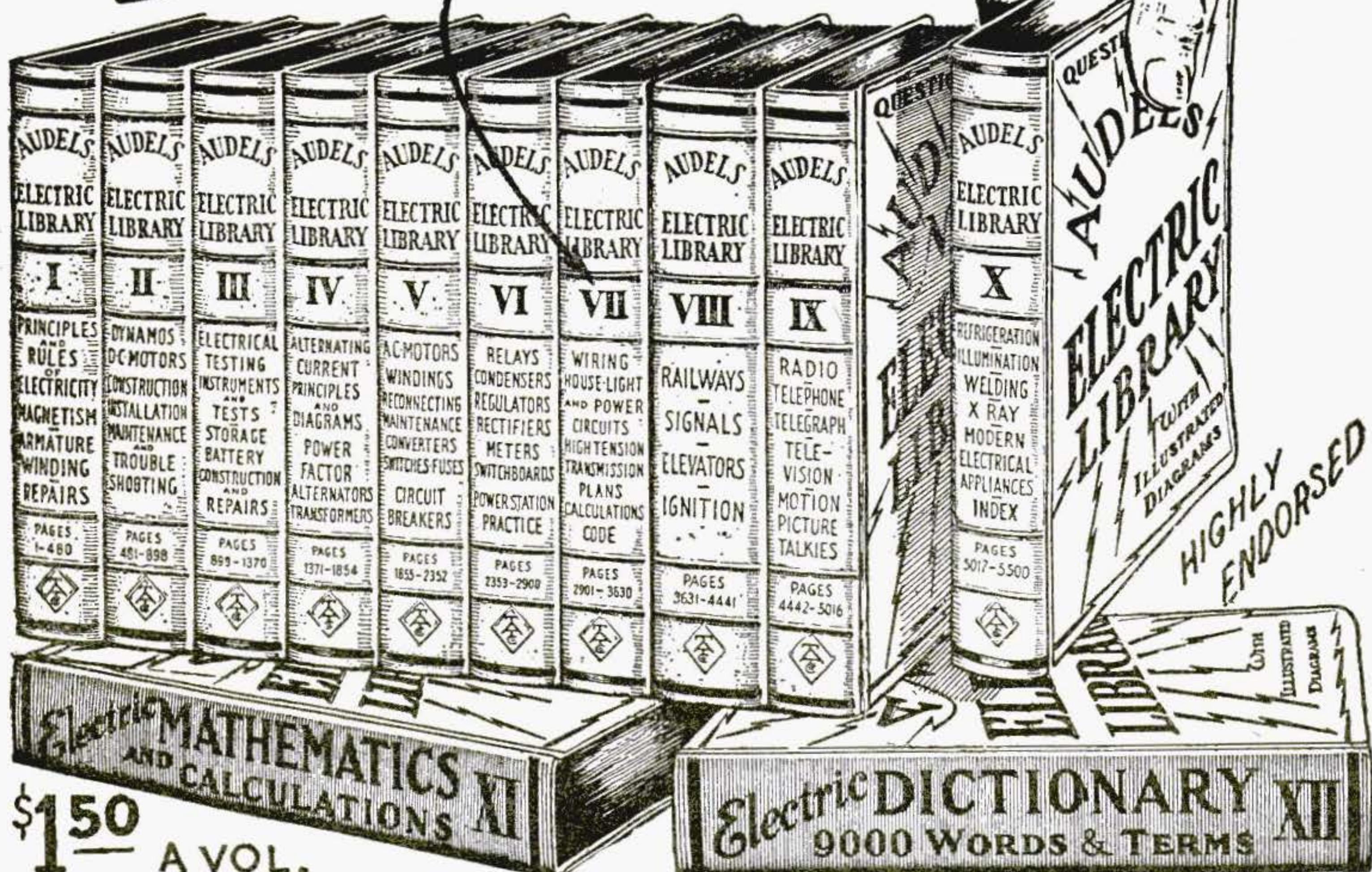
PS—NOV.

NOVEMBER 1948 **7**



House Wiring

Vol. VII TELLS HOW!



\$1.50

A VOL.

HERE ARE THE ANSWERS

MAIL THIS COUPON TODAY

Audels Electric Library gives thousands of answers to your electrical problems. Every Electrician, Engineer, Mechanic, Maintenance Man and Student should know about these very helpful books.

The 12 volumes contain 9500 clear, simplified illustrations of the Theories and Applications of Electricity, and 7200 interesting pages of Practical Trade Information relating to Construction, Operation and Maintenance. Valuable for Ready Reference or Home Study. Price only \$1.50 a volume, sold separately.

Audels Electric Library is truly a progressive home study course in Practical Electricity. Devote 15 to 30 minutes a day to its easy reading — acquire a practical working knowledge of Electricity in all its branches. Written in plain language.

AS A REFERENCE LIBRARY it is valuable. The Quick Finder Index helps you locate the desired information quickly. These books have helped thousands of men by giving them a broader knowledge of the whole field of Electricity. Take this opportunity to use our Book-A-Month Plan; mail the coupon today. No obligation unless satisfied.

AUDELS BOOK-A-MONTH PLAN

You will receive your first book for 7 days' Free Trial and Examination. If you are satisfied, send us only \$1.50. If not O.K., return the book to us and you owe us nothing. When we receive your payment for the first book, we send you the second book.

REMEMBER: You can Start Your Subscription with Any Number you choose or Stop at Any Time. Not a cent to pay until you get the books. No obligation to buy unless satisfied.

AUDEL, PUBLISHERS

49 West 23rd St., New York 10, N.Y.

Please enter my subscription for AUDELS ELECTRIC LIBRARY, price \$1.50 a volume. Mail one volume each month, for which I will remit \$1.50 promptly.

Start with Volume Number _____
Name _____

Address _____

Occupation _____

Employed by _____

PSM

AUDEL, PUBLISHERS, 49 WEST 23rd ST., NEW YORK 10, N. Y.

AUDELS CARPENTERS & BUILDERS GUIDES—(4 Book Set).....\$6

A practical illustrated trade assistant on modern construction for carpenters, joiners, builders, mechanics and all woodworkers. 4 vols., 1600 pages, 3700 illustrations. Fully indexed, flexible covers. Each volume sold separately \$1.50 a vol.

AUDELS PLUMBERS & STEAMFITTERS GUIDES—(4 Book Set).....\$6

A Practical Trade Assistant & Ready Reference. Explains in plain language & by clear illustrations, diagrams, charts, graphs, pictures principles of modern plumbing practice including Marine Pipe Fitting and Air Conditioning. 4 Vols.—1670 Pages—3642 Diagrams & Illustrations. Each Vol. Sold Separately \$1.50 a Vol.

AUDELS OIL BURNER GUIDE.....\$1

384 Pages Covering Installation, Servicing & Repairs All Types Domestic & Industrial Burners. Illustrated. Highly Endorsed.

AUDELS HOUSE HEATING GUIDE..\$4

1000 Pages Covering Working Principles, Installation, Service of All Modern House Heating, Ventilating & Air Conditioning Systems. Explains New Radiant Heating. Fully Illustrated & Indexed.

AUDELS REFRIGERATION & AIR CONDITIONING GUIDE.....\$4

New from Cover to Cover—1280 Pages, Fully Illus. Covering basic principles, servicing, operation & repair of household, commercial & industrial refrigeration & air conditioning. A gold mine of essential important facts for engineers, servicemen, users.

AUDELS SHEETMETAL WORKERS HANDY BOOK.....\$1

Practical inside information. Fundamentals of Sheet Metal Work. 388 pages. Illustrated. 11 sections. Clearly written. Essential & important facts, figures, pointers in everyday language. Ref. Index.

AUDELS SHEETMETAL PATTERN LAYOUTS.....\$4

Developed by Experts for Sheet Metal Workers, Layout Men & Mechanics. A Practical Encyclopedia in 10 Sections, size 7 x 10 x 2—1125 Pages—350 Layouts—1600 Illustrations. 1001 Key Facts. Fully indexed for ready reference in answering your layout problems. Covers all phases of sheet metal work including Pattern Cutting, Pattern Development & Shop Procedure.

AUDELS BLUE PRINT READING.....\$2

For Mechanics & Builders. Covers all types of blue print reading including ship & airplane. 416 pages, fully illustrated.

AUDELS MATHEMATICS & CALCULATIONS FOR MECHANICS \$2.

Mathematics for home study or reference. 700 pages, 550 illus. Practical mathematics from beginning. How to figure correctly. Easy, correct methods covering complete review. Illus. & Indexed.

AUDELS AUTOMOBILE GUIDE.....\$4

A practical quick ready reference book for auto mechanics, service men, operators & owners. Explains theory, construction & servicing of modern motor cars, trucks, buses & auto type Diesel engines. 1700 pages, fully illustrated. 55 chapters. Indexed. A standard book for mechanics. New Hydraulic drive covered.

AUDELS DIESEL ENGINE MANUAL....\$2

A practical, concise treatise with questions and answers on the theory, operation and maintenance of modern diesel engines. Over 400 pages, fully illus. All details plainly brought out, this book is of extreme value to engineers, operators & students.

AUDELS WELDERS GUIDE.....\$1

A concise, practical text on operation & maintenance of all welding machines for all mechanics. Over 400 pages, illustrated. Covers all methods of electric and acetylene welding including airplane work.

AUDELS MACHINIST & TOOLMAKERS HANDY BOOK.....\$4

Covers modern machine shop practice in all its branches. Tells how to set up & operate lathes, screw and milling machines, shapers, drill presses & all other machine & hand tools. 1600 pages, fully illustrated. Indexed. 5 sections. 1—Modern Machine Shop Practice. 2—Blue Print Reading & How to Draw. 3—Calculations & Mathematics for Machinists. 4—Shop Physics. 5—How to Use the Slide Rule. 60 chapters. Easy to read and understand. A shop companion that answers your questions.

AUDELS ELECTRIC MOTOR GUIDE \$4

Practical Information Covering Construction, Control, Maintenance & Wiring Hookups of All Types Electric Motors also Armature Winding. 1000 Pages Fully Illustrated & Indexed.

AUDELS ELEC. WIRING DIAGRAMS \$1

210 Pages. Illustrated. Gives practical facts on wiring of electrical apparatus. It shows clearly how to wire apparatus for practically all fields of electricity. Each diagram is complete & self-explanatory. Highly Endorsed Pocket Companion.

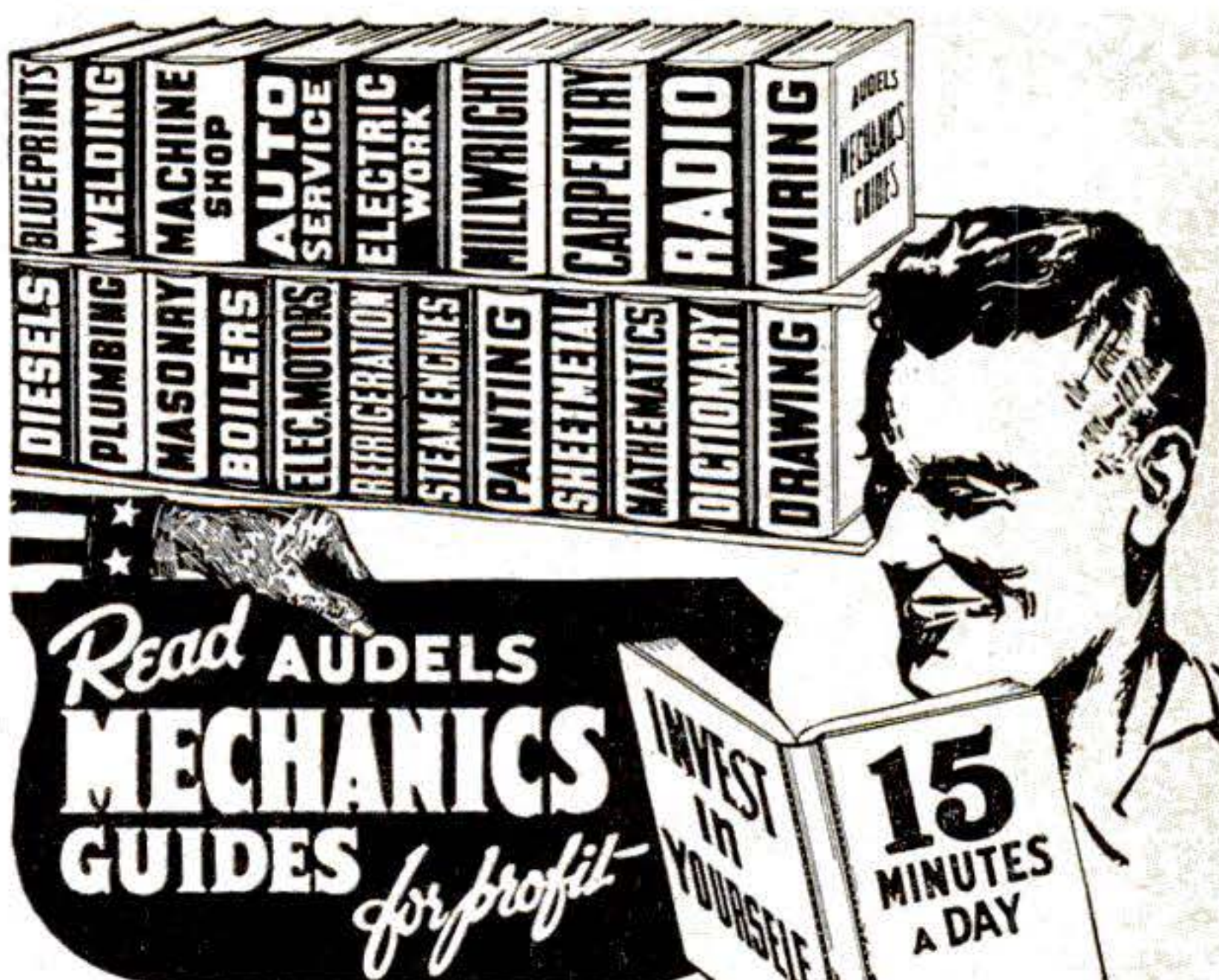
AUDELS PRACTICAL ELECTRICITY \$4

A key to a practical understanding of Electricity. For maintenance engineers, electricians & all electrical workers. 1440 Pages, 2600 Illus. Covers important electrical information in handy form—including wiring for Light & Power. Indexed.

AUDELS RADIOMANS GUIDE.....\$4

A key to the practical understanding of radio including Frequency Modulation, Television, etc., Aircraft & Marine Radio. For radio engineers, servicemen, amateurs, 914 Pages, 633 Illustrations & Diagrams. Photos. Review Questions & Answers. Reference Index.

AUDEL, Publishers, 49 W. 23 St., N.Y. 10



AN AUDEL GUIDE IS A GOOD FRIEND!

Step Up Your Own Skill with the Practical Facts and Figures of Your Trade. Save time and money with right methods, short cuts, labor saving ideas. CHECK NOW! You can look over any Audel Guide in your home. Start the Easy Payments if satisfied.

CUT HERE MAIL ORDER

AUDEL, Publishers, 49 W. 23 St., New York 10, N. Y.

Please mail me for 7 days' free examination the books marked (X) below. I agree to mail \$1 in 7 days on each book or set ordered, and to further mail \$1 a month on each book or set ordered until I have paid the purchase price.

If I am not satisfied with Guides I will return them.

- | | |
|---|------|
| ☐ AUTOMOBILE GUIDE, 1700 Pages | \$ 4 |
| ☐ DIESEL ENGINE MANUAL, 400 Pages | 2 |
| ☐ WELDERS GUIDE, 400 Pages | 1 |
| ☐ CARPENTERS & Builders Guides (4 Book Set) | 6 |
| ☐ PLUMBERS & Steamfitters Guides (4 Book Set) | 6 |
| ☐ MASONS and Builders Guides (4 Book Set) | 6 |
| ☐ BLUE PRINT READING, 416 Pages | 2 |
| ☐ MASTER PAINTER & Decorator, 320 Pages | 2 |
| ☐ GARDENERS & GROWERS GUIDES (4 Book Set) | 6 |
| ☐ OIL BURNER GUIDE, 384 Pages | 1 |
| ☐ HOUSE HEATING GUIDE, 1000 Pages | 4 |
| ☐ REFRIGERATION & Air Conditioning Guide, 1280 Pages | 4 |
| ☐ SHEET METAL WORKERS Handy Book, 388 Pages | 1 |
| ☐ SHEET METAL PATTERN LAYOUTS, 1100 Pages | 4 |
| ☐ AIRCRAFT WORKER, 240 Pages | 1 |
| ☐ MECHANICAL DRAWING GUIDE, 160 Pages | 1 |
| ☐ MECHANICAL DRAWING & DESIGN, 480 Pages | 2 |
| ☐ MATHEMATICS and CALCULATIONS, 700 Pages | 2 |
| ☐ MECHANICAL DICTIONARY, 968 Pages | 4 |
| ☐ MACHINISTS & Toolmakers Handy Book, 1600 Pages | 4 |
| ☐ MILLWRIGHTS & Mechanics Guide, 1200 Pages | 4 |
| ☐ POWER PLANT ENGINEERS GUIDE, 1500 Pages | 4 |
| ☐ ENGINEERS & FIREMANS EXAMINATIONS, 528 Pages | 1 |
| ☐ PUMPS, HYDRAULICS & Air Compressors, 1658 Pages | 4 |
| ☐ MARINE ENGINEERS Handy Book, 1280 Pages | 4 |
| ☐ ENGINEERS and Mechanics Guides (8 Book Set) | 12 |
| ☐ Answers on Practical ENGINEERING, 254 Pages | 1 |
| ☐ ELECTRIC WIRING DIAGRAMS, 210 Pages | 1 |
| ☐ ELECTRICIANS EXAMINATIONS, 250 Pages | 1 |
| ☐ ELECTRIC DICTIONARY, 9000 Terms | 2 |
| ☐ ELECTRIC MOTOR GUIDE, 1000 Pages | 4 |
| ☐ PRACTICAL ELECTRICITY Handy Book, 1440 Pages | 4 |
| ☐ ELECTRICAL POWER CALCULATIONS, 425 Pages | 2 |
| ☐ RADIOMANS GUIDE, 914 Pages | 4 |
| ☐ ELECTRONIC DEVICES, 216 Pages | 2 |
| ☐ NEW ELECTRIC LIBRARY, 7000 Pages (12 Book Set) | 18 |

Vols. I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII—\$1.50 Each

Name.....

Address.....

Occupation.....

Employed by.....

PSM



WERE the great personages of the past victims of a stupendous hoax? Could such eminent men of the ancient world as Socrates, Pericles, and Alexander the Great have been deluded and cast under the spell of witchcraft—or did the oracles whom they consulted actually possess a *mysterious faculty of foresight*? That *the human mind can truly exert an influence over things and conditions* was not a credulous belief of the ancients, but a known and demonstrable fact to them. That there exists a wealth of infinite knowledge just beyond the border of our daily thoughts, which can be aroused and commanded at will, was not a fantasy of these sages of antiquity, but a dependable aid to which they turned in time of need.

It is time you realized that the rites, rituals and practices of the ancients were not superstitions, but subterfuges to conceal the marvelous workings of natural law from those who would have misused them. Telepathy, projection of thought, the materializing of ideas into helpful realities, are no longer thought by intelligent persons to be impossible practices, but instead, *demonstrable sciences*, by which a greater life of happiness may be had.

One of America's foremost psychologists and university instructors, says of his experiments with thought transference and the powers of mind—"The successes were much too numerous to be merely

lucky hits and one can see no way for guessing to have accounted for the results." *Have you* that open-minded attitude of today which warrants a clear, positive revelation of the facts of mind which intolerance and bigotry have suppressed for years? *Advance with the times*; learn the truth about your inherited powers.

Let this free book explain

The Rosicrucians (NOT a religious organization) have been leaders in introducing the ancient wisdom of mental phenomena. Established throughout the world for centuries, they have for ages expounded these truths to those thinking men and women who sought to make the utmost of their natural faculties. Use the coupon below—avail yourself of a pleasing book of interesting information which explains how you may acquire this most *unusual and helpful knowledge*.

The ROSICRUCIANS (AMORC)

USE THIS COUPON

Scribe E. Q. B.
The Rosicrucians, AMORC,
San Jose, California.

I am sincerely interested in knowing more about this unseen, vital power which can be used in acquiring the fullness and happiness of life. Please send me, without cost, the book, "THE MASTERY OF LIFE," which tells me how to receive this information.

Name _____

Address _____

State _____

Choose one of these **2 GREAT FIELDS**

— Get Ready **QUICK** at **COYNE!**

ELECTRICITY OR **RADIO** TELEVISION AND F.M.



This big fire-proof building is occupied entirely by Coyne.

Prepare for Success Quickly... in the

GREAT SHOPS OF COYNE

Conditions today are different. Many "one-operation" jobs that pay well will not last. Plan for steady pay and advancement by training NOW. Come to the great shops of COYNE in Chicago, for "all-around" training in Electricity or Radio-Television—the 2 great opportunity fields.

NOT "HOME-STUDY" COURSES

Our famous "Learn-by-Doing" method gives you practical experience on a massive outlay of equipment. Not by correspondence, but actual shop work plus necessary theory. You are trained right here in the great Coyne shops that has been training men and young men for over 49 years.

ELECTRICITY RADIO TELEVISION F.M. - ELECTRONICS

INCLUDING INDUSTRIAL ELECTRONICS

Big future in Power Plant Work, Motors, Armature Winding, Home and Factory Wiring, Appliances, Refrigeration, Maintenance, Illumination, etc. Electricians are in demand everywhere—lifetime job service to Coyne graduates. Send for BIG FREE BOOK.

A great field now, even greater growth ahead. Here at COYNE you're trained for Construction, Testing, Trouble-Shooting on Radio, Public Address, Sound Picture Units. Training includes FM, Photo-cells, Television, etc. Our training is quick, easy, practical. Many Coyne trained men own well-paying radio businesses of their own.

LARGEST, OLDEST, BEST EQUIPPED SCHOOL OF ITS KIND IN THE U.S.

Pick Field You Like

—Mail Coupon for **Big FREE Book**



Whether you prefer Electricity, or Radio, train on actual equipment, at Coyne. We have a big, fully illustrated book on each course, and we'll send you the one you want, without obligation. Mail coupon — TODAY.



ELECTRIC REFRIGERATION

Added training in Electrical Refrigeration can now be included.

NON-VETERANS who are short of cash can finance most of their tuition and pay in easy monthly payments after graduation. Many earn while learning.

G. I. APPROVED

MEN OF DRAFT AGE!

Coupon brings our special plan for men who may be called for U.S. service.

COYNE

Founded 1899

B. W. COOKE, President

ELECTRICAL AND RADIO SCHOOL

500 So. Paulina Street, Dept. 88-R8, CHICAGO 12, ILL.

B. W. COOKE, President
COYNE ELECTRICAL AND RADIO SCHOOL
500 S. Paulina St., Dept. 88 R8, Chicago 12, Ill.

Send me your BIG FREE BOOK—for the course checked below, including plans for men of draft age. This does not obligate me and no salesman will call.

☐ ELECTRICITY ☐ RADIO—TELEVISION

NAME.....

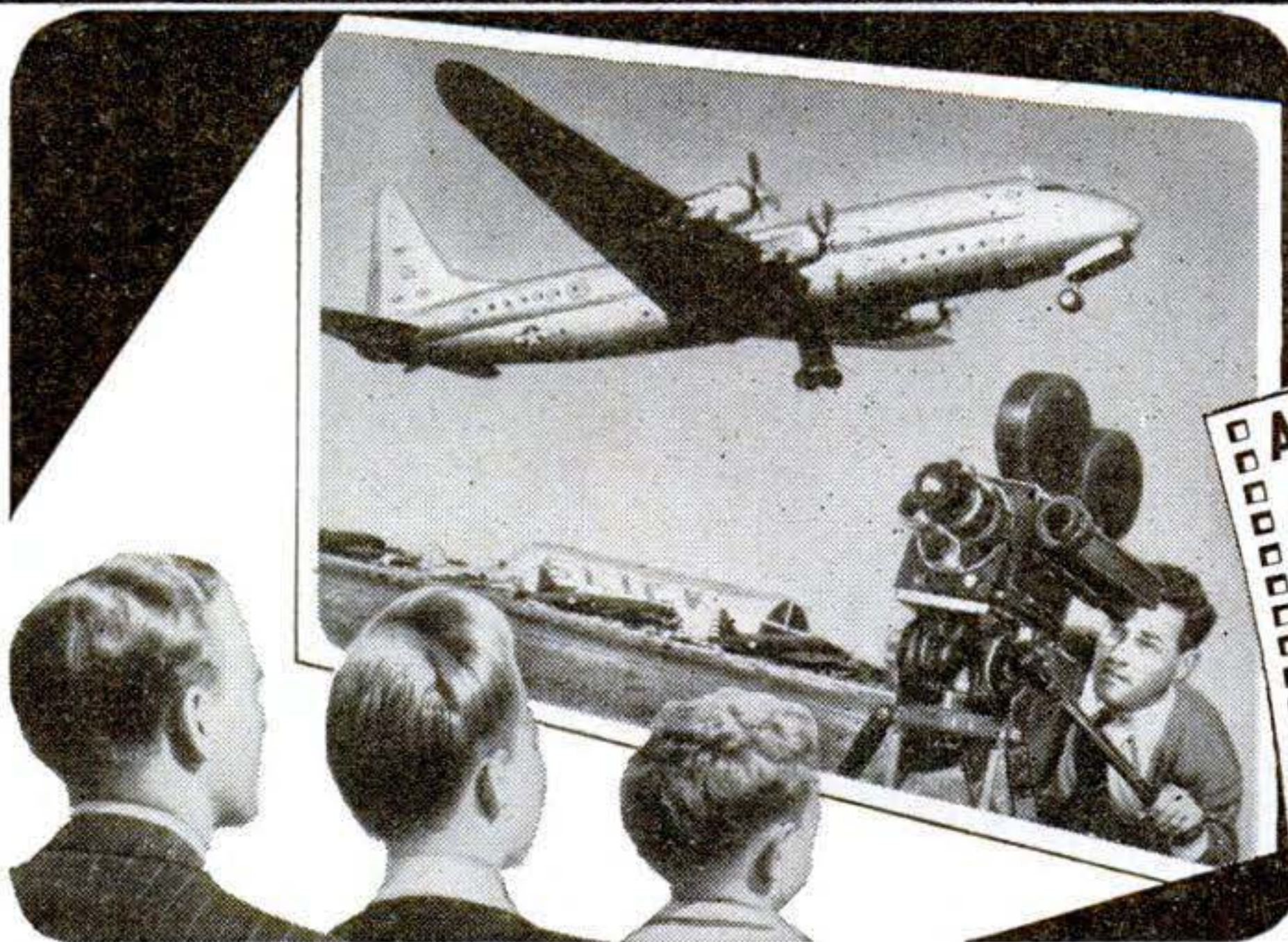
ADDRESS.....

CITY.....STATE.....

OWN CASTLE FILMS

"NEWS PARADE OF THE YEAR"

THE YEAR'S
GREATEST
EVENTS IN
ONE HOME
MOVIE!



8mm

16mm

ALL THIS
IN ONE
FILM

BERLIN
CRISIS

U. S. AIR
GROWTH

WEST'S WORST
FLOODS

PALESTINE
CONFLICT

REVOLT
IN BOGOTA

HOLLAND'S
NEW QUEEN

HISTORIC
MEETING
IN PARIS

PRESIDENTIAL
ELECTION

(Subject to Change)

See Your
PHOTO DEALER
or send him this
handy Order Form

TODAY!



FUN MOVIE
FOR EVERYONE

"CHIMP THE COWBOY"

"Shorty", champ of monkey-business, foils a gang of desperate bank robbers. Excitement and laughs galore as "Shorty's" gags finish them!

Order yours now!

FREE to all projector owners! New 1948 Deluxe Castle Films' catalogue describing a great variety of home movies. **SEND THIS COUPON TODAY!**

CASTLE FILMS

DIVISION OF UNITED WORLD FILMS INC.

445 PARK AVENUE
NEW YORK 22

FIELD BLDG.
CHICAGO 3

RUSS BUILDING
SAN FRANCISCO 4

ORDER FORM

(PS-11)

All Castle Films are available at your local photographic dealer in five editions at these low prices.

"NEWS PARADE of the YEAR"

"CHIMP THE COWBOY"

8 mm

Headline
50 Feet
\$175

Complete
\$550

16 mm

Headline
100 Feet
\$275

Complete
\$875

Sound
\$1750

Name _____

Address _____

City _____

Zone _____

State _____

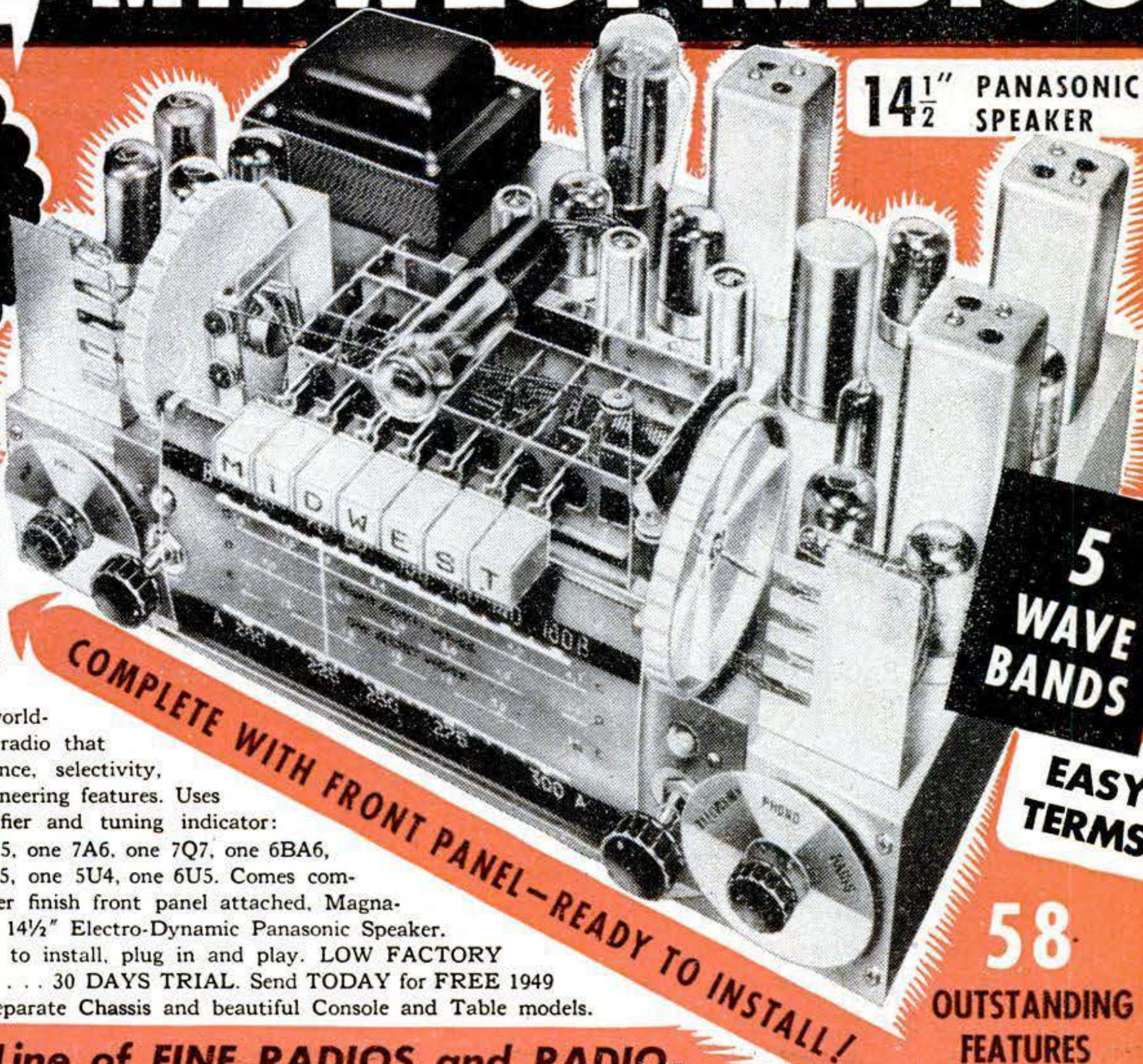
Remittance Enclosed ☐ Send me Castle Films' FREE De Luxe Catalogue ☐

**LOW
FACTORY
PRICES!**

...on the Sensationally **NEW 1949 MIDWEST RADIOS**

**NEW
SERIES 16
SUPER DE LUXE
AM-FM
CHASSIS**

30 DAYS TRIAL



**14 1/2" PANASONIC
SPEAKER**

**5
WAVE
BANDS**

**EASY
TERMS**

58

**OUTSTANDING
FEATURES**

*Including the
Exclusive Midwest*

FLASH-O-MATIC
Volume and Band Indication

TELEVISION
Audio Switch-Over

FIDEL-A-STAT
Color-Ray Tone Selection

TRI-MAGNADYNE
Coil System

*...Plus NO-DRIFT FM
and many other features*

COMPLETE WITH FRONT PANEL—READY TO INSTALL!

Here is the last word in radio engineering . . . a powerful, world-ranging, magnificently-toned radio that is unsurpassed for performance, selectivity, sensitivity, and advanced engineering features. Uses these latest-type tubes, rectifier and tuning indicator: three 7A7, three 7A4, two 7C5, one 7A6, one 7Q7, one 6BA6, one 6BE6, one 6C4, one 6AL5, one 5U4, one 6U5. Comes complete with satin stripe copper finish front panel attached, Magna-Tenna Loop Aerial and giant 14 1/2" Electro-Dynamic Panasonic Speaker. Requires only a few minutes to install, plug in and play. **LOW FACTORY PRICES . . . EASY TERMS . . . 30 DAYS TRIAL.** Send **TODAY** for **FREE 1949 Midwest Radio Catalog** of separate Chassis and beautiful Console and Table models.

A Complete Line of FINE RADIOS and RADIO-PHONOGRAPHS . . . Available in SEPARATE CHASSIS like the POWERFUL SERIES 16 AM-FM Model above or in COMPLETE CONSOLES like this...



Beautiful SYMPHONY GRAND AM-FM Radio-Phonograph with TELEVISION Audio Switch-Over and NEW Intermix AUTOMATIC RECORD CHANGER

A Magnificent musical instrument and a masterpiece of cabinet design—the finest Midwest Radio in 29 years of manufacture. Offers world-ranging radio reception and newest automatic Intermix Record Changing Phonograph. Uses Series 16 Super DeLux AM-FM Chassis. Giant 14 1/2" Panasonic Speaker; Tri-Magnadyne Coil System; Built-In Loop Antenna. Other luxurious console and table model cabinets available with Series 16, 12, and 8 chassis—on Easy Terms and 30 Days Free Trial.

BUY DIRECT FROM FACTORY and SAVE!

MIDWEST RADIO & TELEVISION CORP.

Dept. 244 909 Broadway, CINCINNATI 2, OHIO

Rush for Free Catalog!

**FILL IN COUPON AND MAIL TODAY OR JUST
SEND NAME AND ADDRESS ON 1c POSTCARD**

MIDWEST RADIO & TELEVISION CORP.

Dept. 244, 909 Broadway, Cincinnati 2, Ohio

Please send me your new **FREE 1949 Catalog**. Please Print.

NAME

ADDRESS

CITY ZONE STATE

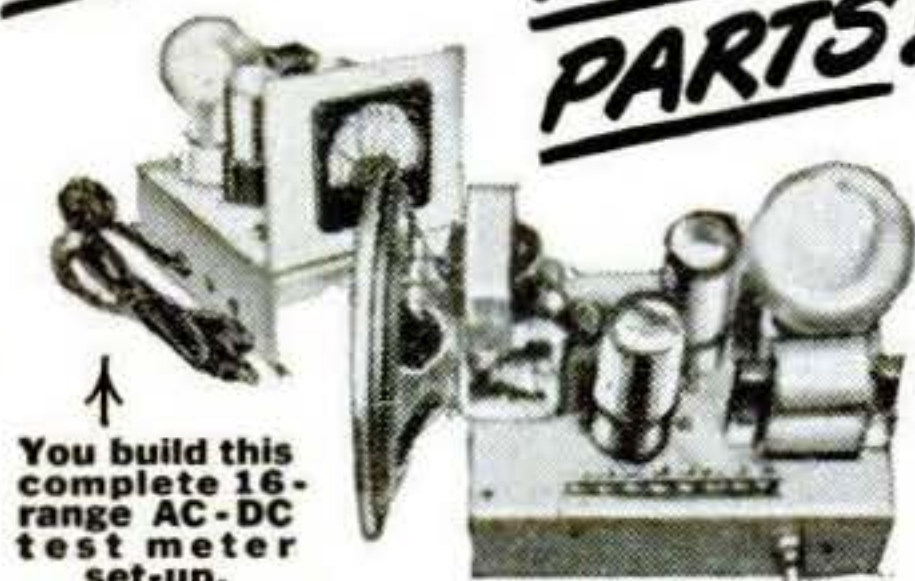
HERE'S
THE
*Complete
Sprayberry
Course!*

LEARN RADIO

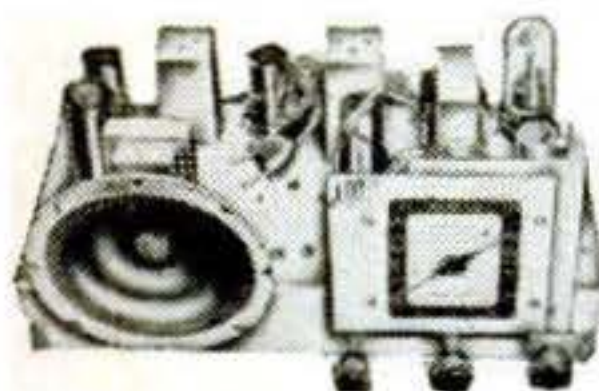
*ELECTRONICS-
TELEVISION!*



*I SEND YOU
8 BIG KITS OF
RADIO
PARTS!*



↑
You build this
complete 16-
range AC-DC
test meter
set-up.



↑
I show you how
to build this
speaker tester
and many other
instruments.
You build, test &
troubleshoot
this powerful 6-
tube super-
het Radio.

I'LL TRAIN YOU AT HOME—BETTER—FASTER by Putting You to Work with Your Hands

In this picture I show you exactly what you'll get from me during your Sprayberry Radio Training. This actual photograph speaks for itself! Sprayberry Radio Training is **really COMPLETE**—I start you with interesting, easily understood basic knowledge and I keep the mailman busy bringing you valuable Service Manuals, profitable Business Builders, extra helps and books—and **8 Big Kits of Actual Radio Equipment!** My course is practical and down-to-earth. You get my personal help every step of the way. My method is **BEST** for you—because you train largely by working with your hands—building, testing, trouble-shooting with parts I supply. With these kits you build a powerful 6 tube superhet Radio, a big 16 range test meter and perform over 175 other fascinating practical experiments.

EARN WHILE LEARNING

Shortly after you enroll I send you my famous **BUSINESS BUILDERS** that help you get and do profitable neighborhood Radio Service jobs while learning. These jobs pay well, and pave the way for a Service Business of your own.

All branches of Radio, Television and Electronics are booming! Trained men are needed NOW! I'll prepare you for your own profitable Radio Service Business or a big pay radio job in double quick time. You learn at home in spare time—you keep your present job and income while getting set for the future.

My course is so perfectly planned—so easy to grasp and understand—you need no previous knowledge or experience in Radio or Electricity. Get the facts now—find out what Sprayberry Radio Training can do for **you**. Mail the coupon below and by return mail I'll rush my big book, "How To Make Money In Radio, Electronics and Television" that tells all about Sprayberry Training. I'll also send you a Sample Lesson, "How To Read Radio Diagrams and Symbols"—all FREE. You'll read many letters from successful Radio men I've trained.

LOW COST Complete TRAINING

Sprayberry Training is surprisingly Low in Cost—and if you desire, convenient monthly payments can be arranged. This is **COMPLETE, UP-TO-DATE** training—covering Radio Repairing, Television and F. M., Industrial Electronics and many other new developments. Sprayberry Trained men really know Radio. This is training that sticks with you and makes money for you.

Mail COUPON Today!

NOW!

**2
Locations
To Serve You
Better!**

Mail Coupon
To Location
Nearest Your
Home

**SPRAYBERRY ACADEMY OF RADIO, Dept. 55-L,
Sprayberry Building, Pueblo, Colorado, or
20 North Wacker Drive, Chicago 6, Illinois**
Rush my FREE BOOK and Sample Lesson.

NAME _____

ADDRESS _____

CITY & Zone _____ STATE _____

☐ Check here if a Veteran

FREE SAMPLE LESSON and Big Catalog

See how quickly and easily you can get your start in Radio, Electronics, Television with Sprayberry Training. Just fill out, clip and mail the coupon NOW for my big FREE book and FREE Sample Lesson. No obligation. No salesman will call. Read all the facts about Sprayberry Training—then decide. Take the first step TODAY—rush the coupon to me.

VETERANS: Approved for G. I. Training under Public Laws 16 and 346. Check coupon and mail today for complete facts.

**Sprayberry Academy of Radio, Dept. 55-L
SPRAYBERRY BLDG. 20 N. WACKER DRIVE
PUEBLO, COLORADO OR CHICAGO 6, ILLINOIS**



INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

82-L DISTRICT NATIONAL BUILDING • WASHINGTON 5, D. C.

Patents

Trademarks

Copyrights

CLARENCE A. O'BRIEN & HARVEY JACOBSON
Registered Patent Attorneys

82-L District National Bldg., Washington 5, D. C.

Please send me copy of "Patent Guide for the Inventor" and also "Record of Invention" form. This request does not obligate me.

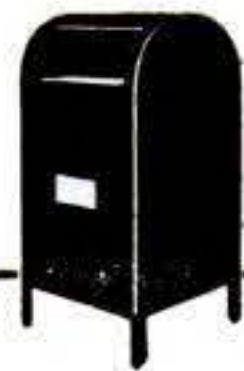
Name _____

Address _____

City _____ State _____

(Please write or print plainly.)

Letters



Canned Television?

Sir:

Since television is now in use, I thought you might like the idea I have in connection with it.

As we all know, as long as we have records to play, we will always want to listen to our favorite music.

Now with television, I think it would be possible to have the players and singers televised on the records. In that way, you'd not only hear them but see them. . . .

C. WOJTENA

Whiting, Ind.

A good idea, but pretty hard to work out. It is interesting to note, however, that facsimile images have already been recorded on wire for later transmission, the visual image being produced entirely by sound. A major difficulty would be to get both the sound and the image from the same record. Perhaps two synchronized records, one providing the image and the other the sound, might be one answer. In any case, though, the cost and complexity of the equipment required, both to record and play back the records, would probably rule out commercial development for some time to come.

Atoms vs. Steam

Sir:

What is the matter with the current writer on atomic energy? Has he lost his imagination? To me—I am just an ordinary electrician—imagination is an indispensable quality. Why should anyone with the ability to comprehend, and write about, power plants, ocean liners, aircraft, and many other devices powered with atomic energy still go back to the steam era?

All of the proposals I have seen have been in this vein: atomic energy to be transformed into steam pressure; steam pressure to drive a turbine or, even less, an inefficient reciprocating engine; and that, in turn, to drive an electric generator. It seems to me they are missing one of the first concepts of physics, due perhaps to the magnitude of the subject. With every transformation of energy there is a loss due

**New Easy Way
TO MAKE
BIG MONEY!
AT HOME**

**FULL
OR SPARE
TIME**

**Permanently
METALLIZED
BABY SHOES**

Costs You Only 5¢-You Get \$6.00

Now is the time to cash in on this big-paying, easy-to-operate year 'round business, and *you need no experience!* With actual illustrations and step by step instructions, YOU can start earning money in only *one week*—up to \$1000 per month full time, or

LARGEST NUMBER OF SUCCESSFUL BUSINESSMEN

Our course has the largest number of successful businessmen in this field today! They are all men and women who acted and are making money. This course is guaranteed—your money will be fully refunded if you are not more than satisfied. There is nothing to lose, so act at once.

- Money Back Guarantee
- Most Successful Name in Metallizing
- Big Income
- Huge Demand
- Sales Plans
- Future Security
- Your Own Boss

\$50 to \$75 per week spare time . . . at \$5.00 per hour. Working only a few hours you can make *more money* than most people make working an entire week.

IMMEDIATE RESULTS

This tested and *proven* method shows you complete details, so that you may start at once, metallizing Baby Shoes, with real GOLD, SILVER or BRONZE. They will last *forever*, retaining every priceless detail of the natural shoes, something for which there are 5 million new customers waiting to buy every year.

BEGIN AT HOME

Don't pass up this real opportunity to start your own business on a shoestring *right at home*. **ACT NOW!** We will send you all the details *absolutely free*.



FREE!

Two actual metallized Baby Shoes guaranteed to be the most attractive on the market—or a pair of your own Baby Shoes metallized if you prefer.

**SEND NO MONEY
USE THIS COUPON**

KIKTAVI

Company Dept. S-5

2111 W. Manchester
Los Angeles 44, California

Rush me **FREE** full particulars at once.

Name _____

Address _____

City _____ State _____

INVENTORS

Patent laws encourage the development of inventions.

We recommend that an inventor employ a registered Patent Attorney or agent, if the inventor is not familiar with patent matters. This is because the value of a patent depends largely upon the skillful preparation of the specification and claims in the patent application.

The firm of McMorrow, Berman and Davidson is registered to practice before the United States Patent Office. Additionally it engages patent attorneys able to readily understand inventors' disclosures, to advise concerning patentability, and to prepare appropriate specifications and claims.

If an inventor believes he has an invention, a search of the most pertinent prior U. S. patents should be made and a report obtained relative to its patentability. Where such report indicates that the invention appears patentable, in order to secure protection, diligence should be exercised in making application for a patent.

Send for a copy of Patent Booklet entitled "How To Protect Your Invention." This booklet contains information on patent protection and procedure. You will also receive an "Invention Record" blank. This will be promptly forwarded to you upon request—no obligation.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • TRADE MARKS • COPYRIGHTS

142-R VICTOR BUILDING, WASHINGTON 1, D. C.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

142-R Victor Building, Washington 1, D. C.

Send me your Patent Booklet, "How To Protect Your Invention", and also "Invention Record" form at once. I understand this request does not obligate me.

Name.....

Address.....

City.....

(WRITE OR PRINT NAME CLEARLY)

When you change to Winter Oil---

YOU NEED PYROIL MORE THAN EVER!

The winter oil you put in your crankcase is low viscosity oil. It is necessary for cold weather starting. But the operating temperature of the motor is much the same in winter as in summer. When you stop your car, turn off the ignition, the low viscosity oil quickly drains off cylinder walls. *Unprotected*, they are subject to corrosion. Dry, the cylinder walls are subject to wear upon starting. *Pyroil gives oil the property of clinging to cylinder walls.* The famous Pyroil film stays there, protecting them from corrosion and wear.

Whenever you add oil—add PYROIL—and add miles to your car.

PYROIL FOR AIRCRAFT ENGINES

Use Aircraft Pyroil B for lubricating oil, Aircraft Pyroil A for gasoline.

GIVEN!

An attractive Pyroil metal savings bank—takes coins up to 50c pieces—is yours for the asking—sent postage paid.

**Manufactured and Guaranteed by
Pyroil Company, 359 Main Street,
La Crosse, Wisconsin.**

*Canadian Distributors:
Central Purchasing Agencies, Ltd.,
Toronto, Ontario*



PYROIL COMPANY

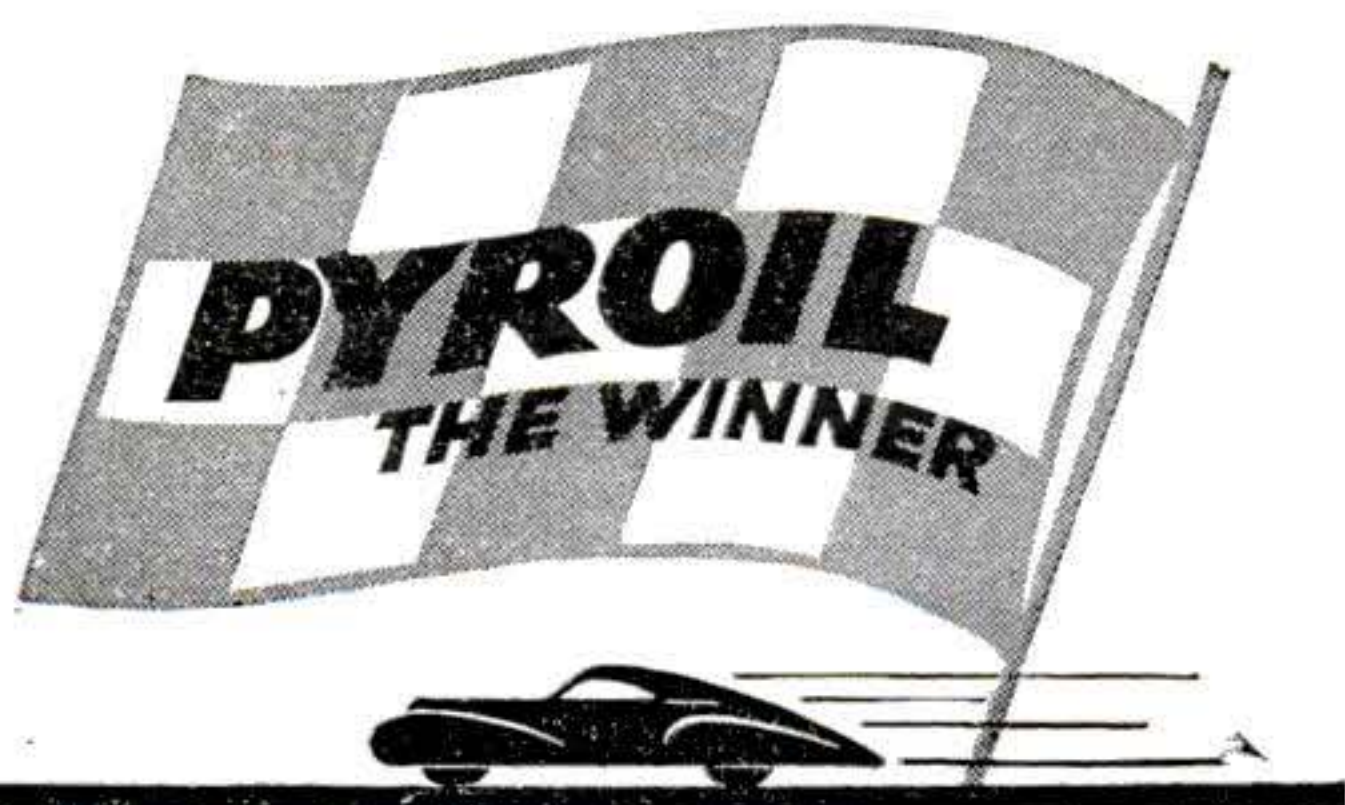
359 Main Street, La Crosse, Wisconsin

I want my car to last and run properly. Please tell me more about Pyroil and how it can accomplish this for me.

Name.....

Address.....

City or Town..... State.....



to the escape of heat, gases, chemicals, radiation, by-products, etc.

With a working knowledge of atomic fission plus a little imagination, it seems to me to be entirely possible to convert atomic energy, with its billions of electron volts (which I confess I do not understand), its free electrons, its beta and gamma rays, its radio activity, etc., directly into electrical energy. I believe that electrical energy is, so far, the most efficient and workable means of transforming energy into everyday uses. Modern science easily and efficiently transforms electricity into mechanical energy, heat, light, chemical, and electronic energy. . . .

A. M. KIRKPATRICK

Sacramento, Calif.

Drawing electricity directly from an atomic pile is a nice idea, but unfortunately nobody has thought of a way to do it. PS mentioned this problem about a year ago ("Artillery Against the Unknown," July '47).

More recently, Dr. Lyle B. Borst, head of the nuclear reactor project at AEC's Brookhaven National Laboratory, said: "We have looked long and hard for a trick method of getting electrical energy directly from the chain reaction. We would greatly enjoy building a chain reactor with two wires leading out to carry away the energy at a modest voltage of a million or so volts . . . We can even dream up a system (with) reasonable efficiency . . . (but it) will not support a chain reaction."

There is some promise in MIT's new high-efficiency thermocouples, which convert heat directly into electricity, but the best are inferior to a good steam plant.

Wishing Well Works Well,

Sir:

In the April '48 issue, page 191, you gave the directions for making a Wishing Well flower pot. I made one for my wife, and since then I have made 70 or 80 for our friends who have seen it. They are the prettiest flower pots I have ever seen.

I made a few changes in the process that may help others in making them. For the roof I used a slat from an old venetian blind, instead of a cigar box. I didn't have the tools for tin work, so I used a cork for the bucket, which I hollowed out. After it has been varnished it looks like an old wooden bucket. Thanks for the complete plans of

INVENTORS

A patent is a valuable right. On the basis of a constitutional provision Congress has established a system under which inventors may secure the exclusive right to prevent the unauthorized use, manufacture and sale of their inventions for periods of seventeen years. The inventor secures this protection by obtaining a patent.

Unless an inventor is thoroughly familiar with such matters, he is advised to employ a competent registered patent attorney, as the value of patents depends largely upon the skillful preparation of the specification and claims.

We recommend that you authorize us to conduct a search through the United States patents pertinent to your invention and to submit a report setting forth our opinion with respect to its patentability.

This firm is registered to practice before the U. S. Patent Office and is available to assist inventors in the preparation and prosecution of their cases. Detailed information and the preliminary steps to take to obtain patent protection will be furnished upon request. *Form below for mailing convenience.*

VICTOR J. EVANS & CO. • *Merlin M. Evans*
REGISTERED PATENT ATTORNEY
340-M MERLIN BUILDING, WASHINGTON 6, D. C.

VICTOR J. EVANS & CO. • Merlin M. Evans
Registered Patent Attorney
340-M Merlin Building, Washington 6, D. C.

Please send me without obligation a copy of your booklet "Patent Protection For Inventors" together with your convenient "Evidence of Invention" form.

Name.....

Address.....

City and State.....

PATENTS

TRADEMARKS

COPYRIGHTS

NOVEMBER 1948 19

4 Keys to

SUCCESS IN AVIATION

Through **Embry-Riddle** Training



AIRCRAFT & ENGINE MECHANICS

1



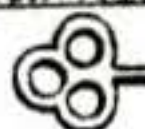
We have hundreds of urgent requests for A.&E. Mechanics -- key men in Aviation. Certification may lead to a career in flight, maintenance or aeronautical engineering. Training in a C.A.A. approved school is the quickest way to get ahead. Embry-Riddle students learn fast with modern equipment...working on live aircraft in airline-size hangars.

COMMERCIAL PILOTS

Flying holds a real future for Embry-Riddle trained pilots. A quarter-century of experience with 30,000 students...the best instructors, up-to-date aircraft, superb year-round flying weather...qualifications unexcelled anywhere. Multi-engine, instrument and horsepower ratings are also available.



2



3

FLIGHT CREW TRAINING



Embry-Riddle's Air Carrier Training Division is the key to your aviation dream -- an airline job aloft! Get your Air Transport Rating and complete air crew training to meet scheduled airlines specifications in minimum time. Embry-Riddle Air Carrier graduates are in demand.



A.&E.

COMBINED WITH COMMERCIAL

Pilot Mechanics who can test fly the ships they repair...executive pilots able to service their own aircraft -- airmen with dual ability are needed by aviation companies and operators. Embry-Riddle combination training offers you the most in your aviation career.



4



Aviation needs

you now! Never has there been such opportunity for you in Aviation. Start your career now at Embry-Riddle -- living facilities directly on the Airport. Write today for full information and proof of job opportunities.

Authorized G. I. Training

Dean of Enrollments -- Dept. 91
Embry-Riddle School of Aviation
MIAMI 30, FLORIDA
Please Print

NAME _____

ADDRESS _____

City _____

State _____ Age _____

I am interested in...

- ☐ A.&E. Mechanic
- ☐ Commercial Pilot
- ☐ Air Carrier Training
- ☐ A.&E. Combined with Commercial Pilot
- ☐ Flying Mechanic

Check One ☐ Veteran ☐ Non-Veteran

TRAIN IN MIAMI--AIR CAPITAL OF THE WORLD

an original idea, and I hope there will be many more to follow.

R. L. SOUTHWICK

Tampa, Fla.

Seeing a Molecule's Shadow

Sir:

In the article "Super Microscopes to Open New World" [PS, July '48, p. 122] there is a photograph showing a molecule of polystyrene latex. The photograph shows a definite shadow cast by the molecule.

I would like to know if this is possible. It seems to me that the electron microscope could not reproduce anything such as a shadow. And even if it could, the wave length of visible light would be longer than the diameter of the molecule, making it impossible for the molecule to cast such a shadow. . . .

RICHARD S. SAKURAI

Portland, Ore.

The shadow is not an optical one, as Mr. Sakurai correctly reasons. It is the result of a technique often used to enhance the clarity of images in the electron microscope. In preparing the specimen for examination, it is subjected to a "sputtering" of chromium or other metal, of which a thin film is deposited. High points on the specimen shield nearby areas and leave uncoated spots resembling shadows. The photograph is an example of this very striking effect.

Landing the XB-48

Sir:

In your October, 1947, issue you ran a picture of the Martin XB-48 six-jet bomber with bicycle landing gear. I have been puzzling, on and off, ever since about how an airplane with fore-and-aft wheels is landed. Do you land it on the front wheel first, the rear wheel, or both at once?

JAMES CHRISTENSEN

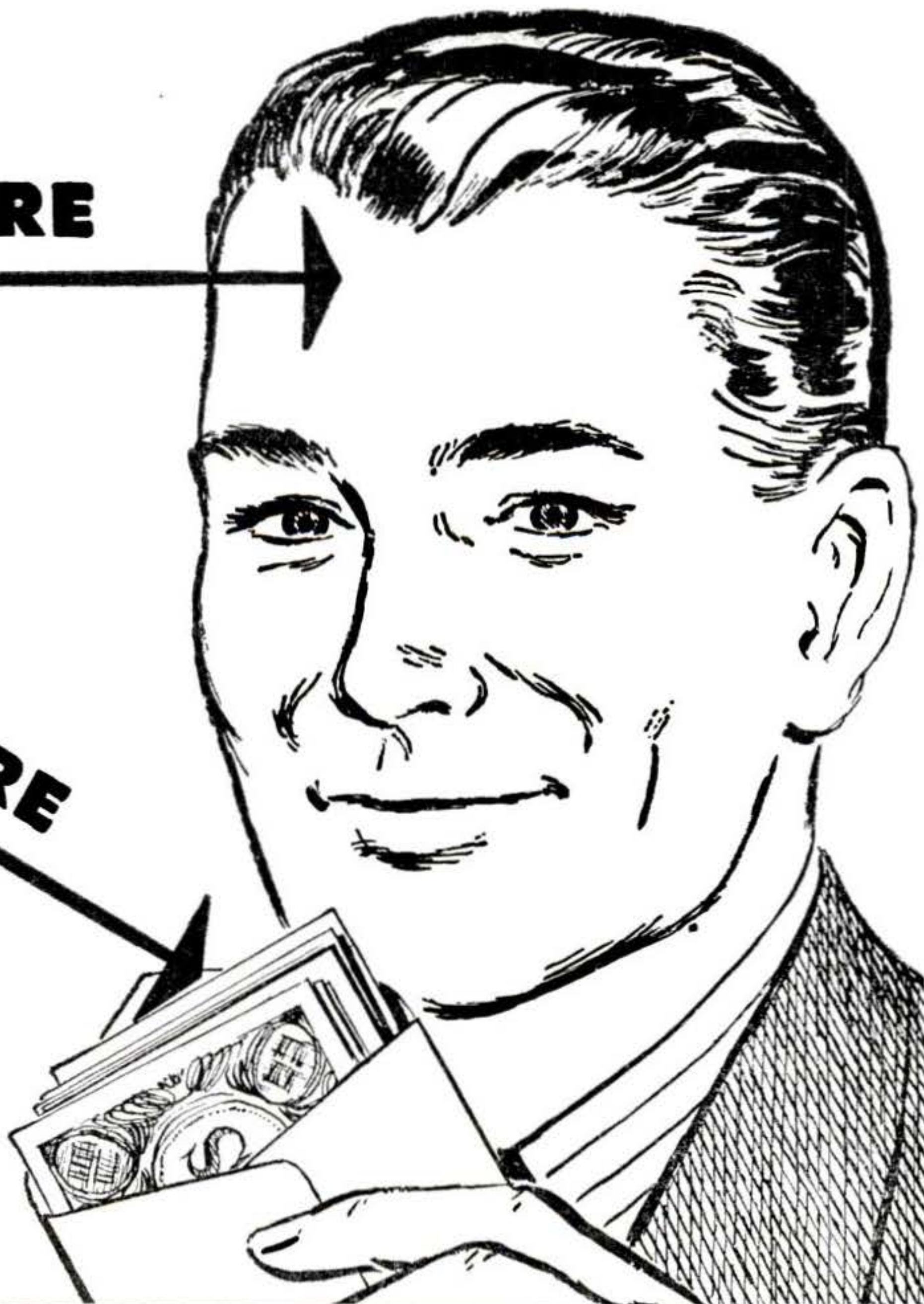
St. Louis, Mo.

Good question. The ideal landing is one made at approximately 10 percent above stall speed, which allows both wheels to touch simultaneously. A full stall landing may also be made, allowing the rear wheel to touch first, or a high-speed, nose-wheel landing, which is similar to landing on conventional gear. In a high cross wind, the up-wind wing must be kept level or slightly

PUT MORE HERE

GET MORE HERE

START HERE



INTERNATIONAL CORRESPONDENCE SCHOOLS



BOX 7617-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

- | | | | |
|--|--|--|---|
| Air Conditioning and Plumbing Courses
☐ Air Conditioning
☐ Heating
☐ Refrigeration
☐ Plumbing
☐ Steam Fitting
Chemistry Courses
☐ Chemical Engineering
☐ Chemistry, Analytical
☐ Chemistry, Industrial
☐ Chemistry, Mfg. Iron & Steel
☐ Petroleum Refining
☐ Pulp and Paper Making
☐ Plastics
Civil Engineering, Architectural and Mining Courses
☐ Architecture
☐ Architectural Drafting
☐ Bridge and Building Foreman
☐ Building Estimating
☐ Civil Engineering
☐ Coal Mining
☐ Contracting and Building
☐ Highway Engineering
☐ Lumber Dealer
☐ Reading Structural Blueprints
☐ Sanitary Engineering
☐ Structural Drafting | ☐ Structural Engineering
☐ Surveying and Mapping
Communications Courses
☐ Electronics
☐ Practical Telephony
☐ Radio, General
☐ Radio Operating
☐ Radio Servicing
☐ Telegraph Engineering
Electrical Courses
☐ Electrical Drafting
☐ Electrical Engineering
☐ Electric Light and Power
☐ Lighting Technician
☐ Practical Electrician
Internal Combustion Engines Courses
☐ Auto Technician
☐ Diesel-Electric
☐ Diesel Engines
☐ Aviation
☐ Gas Engines
Mechanical Courses
☐ Aeronautical Engineer's, Jr.
☐ Aircraft Drafting
☐ Forging
☐ Heat Treatment of Metals
☐ Industrial Engineering | ☐ Industrial Metallurgy
☐ Machine Shop
☐ Mechanical Drafting
☐ Mechanical Engineering
☐ Mold-Loft Work
☐ Patternmaking—Wood, Metal
☐ Reading Shop Blueprints
☐ Sheet-Metal Drafting
☐ Sheet-Metal Worker
☐ Ship Drafting
☐ Tool Designing
☐ Welding Engineering
☐ Welding—Gas and Electric
Railroad Courses
☐ Air Brake
☐ Diesel Locomotive
☐ Locomotive Engineer
☐ Locomotive Fireman
☐ Locomotive Machinist
☐ Railroad Section Foreman
Steam Engineering Courses
☐ Boilermaking
☐ Combustion Engineering
☐ Engine Running
☐ Marine Engineering
☐ Steam Electric | Textile Courses
☐ Cotton Manufacturing
☐ Loom Fixing
☐ Textile Designing
☐ Woolen Manufacturing
☐ Rayon Weaving
Business and Academic Courses
☐ Accounting
☐ Bookkeeping
☐ Business Administration
☐ Business Correspondence
☐ Certified Public Accounting
☐ Commercial
☐ Cost Accounting
☐ Federal Tax
☐ Foremanship
☐ Good English
☐ Higher Mathematics
☐ Motor Traffic
☐ Retailing
☐ Retail Store Management
☐ Salesmanship
☐ Sign Lettering
☐ Spanish
☐ Advertising
☐ Commercial Art
☐ First Year College
☐ French
☐ High School
☐ Postal Civil Service
☐ Secretarial
☐ Stenography
☐ Traffic Management |
|--|--|--|---|

Name _____ Age _____ Home Address _____
 City _____ State _____ Working Hours _____ A.M. to _____ P.M.
 Present Position _____ Employed by _____

Special tuition rates to members of the Armed Forces. Enrollment under G.I. Bill and P.L. 16 approved for World War II Veterans.
 Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Lend Me 15 Minutes A Day



*..and I'll prove
I can make you
a **NEW MAN***

I'M trading in old bodies for new! I'm taking men who know that the condition of their arms, shoulders, chests and legs—their strength, "wind," and endurance—is not 100%. And I'm making **NEW MEN** of them!

If you can simply raise your arm and flex it, I can add **SOLID MUSCLE** to your biceps—yes, on each arm—in double-quick time! I can broaden your shoulders, strengthen your back, develop your whole muscular system **INSIDE and OUTSIDE!**

What Only 15 Minutes a Day Can Do

I can add inches to your chest, give you a vise-like grip, make those legs of yours lithe and powerful. I can shoot new strength into your old backbone, exercise those inner organs, help you cram your body so full of pep, vigor and red-blooded vitality that you won't feel there's even "standing room" left for weakness and that lazy feeling! Before I get through with you I'll have your whole frame measured" to a nice, new, beautiful suit of muscle!

I Was a 97-lb Weakling

All the world knows I was **ONCE** a skinny, scrawny 97-pound weakling. And **NOW** it knows that I won the title, "The World's Most Perfectly Developed Man." Against all comers! How did I do it? How do I work miracles in the bodies of other men in only 15 minutes a day? The answer is "**Dynamic Tension**," the amazing method I discovered and which changed me from a 97-pound weakling into the champion you see here!

FREE THIS FAMOUS BOOK "EVERLASTING HEALTH AND STRENGTH"

Almost two million men have sent for and read my book, "Everlasting Health and Strength." It tells you exactly what "**Dynamic Tension**" can do. And it's packed with pictures that **SHOW** you what it does. Results it has produced for other men.

RESULTS I want to prove it can get for **YOU!** Learn how you can actually become a **NEW MAN**, right in the privacy of your own home and in only 15 minutes a day! Mail this coupon **NOW!** **CHARLES ATLAS**, Dept. 1-L, 115 East 23rd St., New York 10, N. Y.

Charles Atlas

Actual photo of the man who holds the title, "The World's Most Perfectly Developed Man."



**CHARLES ATLAS, Dept. 1-L,
115 East 23rd St., New York 10, N. Y.**

I want the proof that your system of "**Dynamic Tension**" will help make a New Man of me—give me a healthy, husky body and big muscular development. Send me your free book, "Everlasting Health and Strength."

Name.....Age.....
(Please Print or Write Plainly)

Address.....

City.....State.....

down. This same problem exists on a flying boat, but is quite easy to control.

500 Bird Cages?

Sir:

In the August number of PS, page 175, a writer says to keep birds away from strawberry beds by putting bird cages over the plants. What a joke. I have 500 plants in my strawberry beds . . . 500 bird cages?

Here is my plan, and it works. Get an old, worn-out garden hose, cut it into 3-foot lengths, and put these between the rows, about 10 feet apart. To the birds, these are snakes, and you should see the robins and other birds as they roost on the wire fence and never go near the berries.

MRS. L. M. MITCHEL

Toledo, Ohio

Thermometer Gets a Cold Shoulder

Sir:

I have been told that a reliable method for testing the accuracy of an ordinary thermometer is to place it in a pan of cracked ice—that under this condition it should register 32 degrees. . . .

LESLIE M. PINNEY

New Castle, Pa.

Yes, but adding a little water to the ice will make it easier. Don't worry about melting the ice—ice melts at 32° F.

Puzzling Projectiles

Sir:

My friend contends that two identical projectiles, one fired on a horizontal and the other dropped from an equal height at the same instant the first leaves the muzzle of the gun, will both reach the ground at the same time.

I say that this is only true in theory. In actual practice it would not work out, due to air pressure, muzzle velocity, and other governing factors.

ARTHUR C. BECKER

Woodhaven, N. Y.

Mr. Becker's friend gets the decision on this one. The falling or vertical motion of each projectile is due to gravity alone and thus is entirely independent of any horizontal motion; so the projectiles would strike the ground at the same time.

To the man who wants to enjoy
an ACCOUNTANT'S CAREER

IF you're that man, here's something that will interest you.

Not a magic formula—not a get-rich-quick scheme—but something more substantial, more practical.

Of course, you need something more than just the desire to be an accountant. You've got to pay the price—be willing to study earnestly, thoroughly.

Still, wouldn't it be worth your while to sacrifice some of your leisure in favor of interesting home study—over a comparatively brief period? Always provided that the rewards were good—a salary of \$3,000 to \$10,000?

An accountant's duties are interesting, varied and of real worth to his employers. He has *standing*!

Do you feel that such things aren't for you? Well, don't be too sure. Very possibly they *can* be!

Why not, like so many before you, investigate LaSalle's modern Problem Method of training for an accountancy position?

Just suppose you were permitted to work in a large accounting house under the personal supervision of an expert accountant. Suppose, with his aid, you studied accounting principles and solved problems day by day—easy ones at first—then more difficult ones. If you could do this—and could turn to him for advice as the problems became complex—soon you'd master them all.

That's the training you follow in principle under the LaSalle Problem Method.

Over 2800 Certified
Public Accountants among
LaSalle alumni

You cover accountancy from the basic Principles right up through Accountancy Systems and Income Tax Procedure. Then you add C. P. A. Training and prepare for the C. P. A. examinations.

As you go along, you absorb the principles of Auditing, Cost Accounting, Business Law, Statistical Control, Organization, Management and Finance.

Your progress is as speedy as you care to make it—depending on your own eagerness to learn and the time you spend in study.

Will recognition come? The only answer, as you know, is that success *does* come to the man who is really *trained*. It's possible your employers will notice your improvement in a very few weeks or months. Indeed, many LaSalle graduates have paid for their training—with increased earnings—before they have completed it! For accountants, who are trained in organization and management, are the executives of the future.

Write For This Free Book

For your own good, don't put off investigation of *all* the facts. Write for our free 48-page book, "Accountancy, The Profession That Pays." It'll prove that accountancy offers brilliant futures to those who aren't afraid of serious home study. We'll also include "Ten Years' Promotion in One"—a book which has helped many men. Send us the coupon *now*.

**LASALLE EXTENSION
CHICAGO 5, ILL.**

- Other LaSalle Opportunities**

 - ☐ Higher Accountancy
 - ☐ C.P.A. Coaching
 - ☐ Bookkeeping
 - ☐ Law: LL.B. Degree
 - ☐ Business Management
 - ☐ Salesmanship
 - ☐ Traffic Management
 - ☐ Foremanship
 - ☐ Industr'l Management
 - ☐ Stenotypy (Machine Shorthand)

**LASALLE EXTENSION UNIVERSITY
A CORRESPONDENCE INSTITUTION**

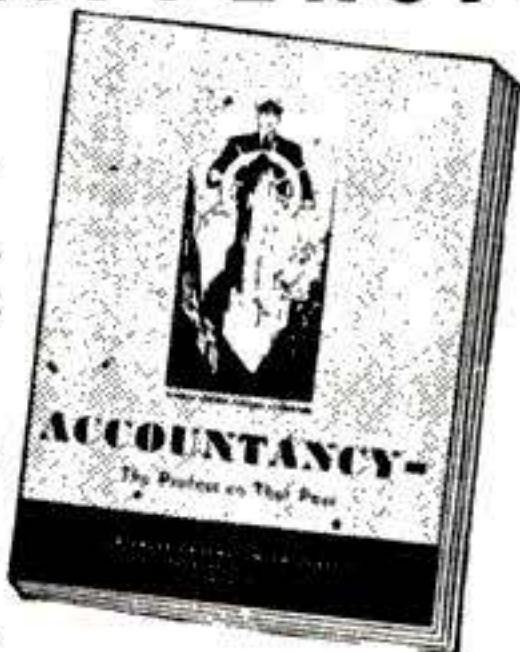
417 S. Dearborn St. Dept. 1183-HR Chicago 5, Ill.

I want to be an accountant. Send me without obligation, "Accountancy, the Profession that Pays" training program—also "Ten Years' Promotion in One."

Name.....Age.....

Address.....

City, Zone & State.....



WELLER MANUFACTURING COMPANY
Easton, Penna., U. S. A.

Please send me

_____ Weller Handy Guides to Better Soldering at 10c
_____ Weller Soldering Guns single heat at \$12.95
or dual heat at \$14.95

_____ Free Descriptive Literature

☐ check or money order, postage prepaid.
☐ C. O. D.

Name _____

Address _____

City _____ Zone _____ State _____



*Now learn
how easy—and
profitable—
SOLDERING
can be!*

**SEND THIS
COUPON TODAY!**



FLEXITIP
easily formed
LONG REACH
—slips right into tight spots
5 SECOND HEATING
no waiting, saves power
SOLDERLITE
spotlights the work
**BUILT-IN TRANS-
FORMER**—compact and complete
DUAL HEAT—single heat 100 watts, dual heat 100/135 watts; 110 volts, 60 cycles

**WITH WELLER GUNS YOU DO
PROFESSIONAL WORK! HERE'S WHY . . .**

Light, right and rugged, Weller Guns make soldering a pleasure. Five-second heating does away with tire-some waiting. Pre-focused Solderlite spotlights the work. Easily formed Flexitips and extra length reach through wiring and into tight corners for soldering. Flexitips can also be readily shaped for hundreds of other homecraft uses. No need to unplug when not in use. Heat comes "on" only when you pull the trigger. **FOR HOME WORKSHOPS • ELECTRICIANS • RADIO SERVICE MEN • MOTOR REPAIR SHOPS • TELEPHONE WORK • WOOD BURNING • SCULPTURING • BRANDING • LEATHER TOOLING**

BE SURE TO GET YOUR COPY

"Soldering Tips" the new Weller Handy Guide to easier, faster soldering—20 pages fully illustrated.

To get your Weller Gun and "Soldering Tips" booklet without delay, clip and mail the coupon now!



WELLER
MANUFACTURING COMPANY

802 Packer Street • Easton, Pa.

AT LAST!

New **MAN-SIZED
AIR GUN!**

HY-SCORE

*Super-
Powered!*

.177 or .22

No Pumping
One single break



New 1949 model. All steel like a regular firearm, 41 $\frac{3}{8}$ inches long, 4 $\frac{3}{4}$ lbs., rifled barrel. Single shot. **EXTREMELY ACCURATE.** Small game and targets. Cal. .177 or cal. .22 price \$29.85. (Order Hy-Score pellets \$1.49 for cal. .177, \$1.88 for cal. .22, per box 500).

If your dealer cannot supply, write for free booklet, Dept. PS-11

S. E. LASZLO • BROOKLYN 1, N.Y.

**Famous BAILEY
TECHNICAL SCHOOLS**

OFFER THE FOLLOWING COURSES:

**PRACTICAL DIESEL ENGINEERING
REFRIGERATION - AIR CONDITIONING
COMMERCIAL ELECTRICITY
RADIO - TELEVISION MECHANICS**

Your future success depends largely on the reputation of the school you attend. Don't take chances! Train at America's foremost school of mechanical specialization. Bailey is *recognized* and *approved* by industry. Bailey graduates get the top pay jobs! G.I. Approved. Send for **FREE** Catalog.

BAILEY TECHNICAL SCHOOLS

1656 So. Grand Blvd., St. Louis, Mo.

Practical Shop Training

in

**REFRIGERATION
AIR CONDITIONING**

and/or

**PRACTICAL ELECTRICITY
MAJOR APPLIANCES**

Service, Maintenance, Installation

Write for Details

COMMERCIAL TRADES INSTITUTE
202 SO. 20TH ST., BIRMINGHAM, ALA.

Veterans Inquire About GI Training

Train in
the Magic
City of
the South

Member: Southern Association of Private Trade Schools.

10 Reasons Why...

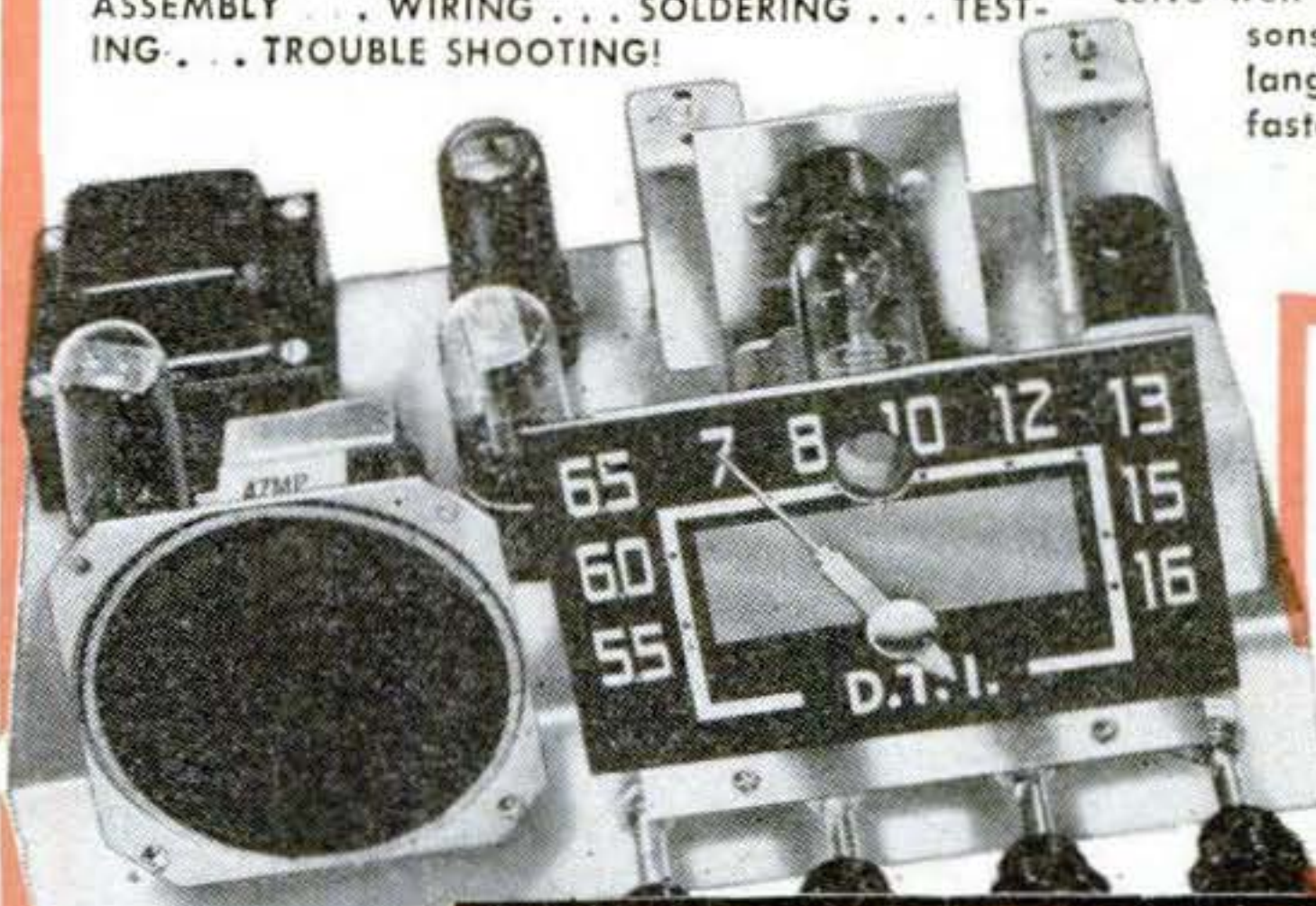
D.T.I. IS ONE OF YOUR BEST BUYS

- 1** You profit from our 17 years of "Know-how" in preparing men for real opportunities in the Radio-Electronics field.
- 2** A faculty of more than 60 skilled residential and 15 extension instructors to guide students in their training.
- 3** You may learn at home or in our new, modern laboratories in Chicago.
- 4** Home Movies, an exclusive D.T.I. feature, help you learn faster... easier at home
- 5** You receive many shipments of commercial-type equipment which give you practical "on-the-job" experience in your own home. You keep all of this equipment — working about 180 experiments, including a permanent 6-tube Radio Receiver the entire family will enjoy.
- 6** You build and keep modern-type test equipment which you can regularly use for analyzing, checking and testing purposes.
- 7** You also get lessons with many illustrations and schematic drawings that make electronic circuits easier to understand.
- 8** The only training of its kind to be awarded the Certificate of Merit by the New York Museum of Science and Industry.
- 9** EFFECTIVE EMPLOYMENT SERVICE is available when you complete your training to help you get started.
- 10** Consultation Service: After you have completed your training, you are privileged to write for additional information to help you with "on-the-job" problems.

D.T.I. can prepare you for a profitable future in
TELEVISION
Radio - Electronics



You BUILD and KEEP this jewel bearing MULTI-METER (above) and 6-tube "Super-Het" Receiver (below) giving you practical experience at home in ASSEMBLY... WIRING... SOLDERING... TESTING... TROUBLE SHOOTING!



EMPLOYMENT SERVICE

When you complete your training, our Employment Service will help you get started. Mail coupon today for full details.

See how DeForest's Training, Inc. can start preparing you now for the opportunities ahead in TELEVISION... RADIO... ELECTRONICS. We provide practical training in your own home to help you gain the confidence and "know-how" to fit you for a responsible, well-paying job or your own business. D.T.I. trains you rapidly, thoroughly, by using modern instruction methods and equipment. Write today for free facts on how you, too, may get started toward a profitable, exciting career.

NO EXPERIENCE NECESSARY

D.T.I. sends every major aid to speed your home training. In addition to the many shipments of Radio-Electronics parts and assemblies, you receive well illustrated, loose-leaf lessons, prepared in clear, simple language to help you learn faster, easier.

YOU ALSO USE HOME MOVIES

Only D.T.I. provides you with this all important home training aid that makes Radio-Electronics principles remarkably clear and easier to understand. We lend you a 16 mm. projector and many reels of information-packed film.

DeFOREST'S TRAINING, INC.

CHICAGO, ILLINOIS

Associated with the DeVry Corporation,
Builders of Electronic and Movie Equipment

MAIL THIS OPPORTUNITY COUPON NOW!

DeForest's Training, Inc.
2533 N. Ashland Ave. Dept. PS-E11
Chicago 14, Illinois

Send me complete details, showing how I may make my start in Radio-Electronics-Television. No obligation.

Name Age.....

Address Apt.....

City Zone.... State.....

☐ If under 16, check here for special information ☐ If a discharged veteran of World War II, check here.

"LEARN-BY-DOING" ELECTRICITY

**NATION'S
LARGEST
EXCLUSIVE
ELECTRICAL
SCHOOL**

**PRACTICAL TRAINING
NOT "HOME STUDY"**

G.I. APPROVED Get actual experience in great shops of M.T.I. Learn all phases Practical Electricity; Housewiring, Motors, Const., Maintenance, etc. Living arrangements, Part-time jobs, etc.

Send coupon TODAY.

MICHIGAN TECHNICAL INSTITUTE ☐ Veteran
2281 W. Fort St., Detroit, Mich., Dept. PS-11

Name _____
Street _____
City _____ State _____

TRAIN NOW FOR AN AVIATION CAREER IN SUNNY SOUTHERN CALIFORNIA

MAXIMUM TRAINING IN MINIMUM TIME

Specializing in AERONAUTICAL ENGINEERING and MASTER AVIATION MECHANICS since 1929... America's Finest Aeronautical Institute... 7000 successful graduates... **MAKE MORE MONEY... MAIL COUPON TODAY. APPROVED FOR VETERANS.**
Board and Room now available.

Without obligation, send free catalogue with full information.

NAME _____ AGE _____ PS-11
ADDRESS _____
CITY _____ ZONE _____ STATE _____

CAL-AERO TECHNICAL INSTITUTE
GRAND CENTRAL AIR TERMINAL • GLENDALE 1, CALIFORNIA

Photography for



PLEASURE or PROFIT

Learn at home. Spare time. Practical basic training. Long-established school. Many have earned while learning. Send coupon below for free booklet, "Opportunities in Modern Photography" and full particulars.

AMERICAN SCHOOL OF PHOTOGRAPHY

1315 Michigan Avenue Dept. 1368 Chicago 5, Illinois
Send booklet, "Opportunities in Modern Photography," full particulars and requirements. No salesman will call.

Name _____ Age _____
Address _____
City _____ Zone _____ State _____

INVENTORS

IF YOU WISH TO PROTECT YOUR INVENTION,
You should take steps to protect it by a U. S. Patent.
Write me for "Record of Invention" form.

CARL MILLER
REGISTERED PATENT ATTORNEY

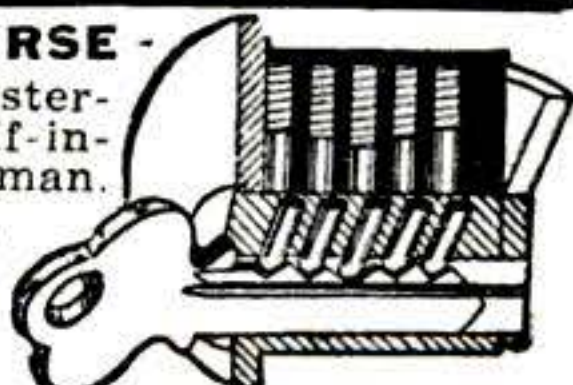
Woolworth Bldg., 35th Floor, Dept. 118-C, New York City
Please send me "Record of Invention" form.

NAME _____
ADDRESS _____

locksmithing and key making

PRACTICAL UP-TO-DATE COURSE

How to pick locks, de-code, make master-keys, install, service, etc. New, self-instruction lessons for every handyman, home-owner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith, cycle shop. Good steady money-making trade!



53 EASY ILLUSTRATED LESSONS

Full price only \$3.95, nothing more to pay. Satisfaction or your money back. Fill in coupon at bottom of page and mail today.

NELSON-HALL CO.
1139 S. Wabash Ave. Chicago 5, Ill.

watch and clock repairing

LEARN AT HOME—IN YOUR SPARE TIME

Prepare now for a happy future of prosperity, security. Fascinating high-grade occupation for men of almost any age or physical condition. You can earn while you learn.

PRACTICAL COURSE IN HOROLOGY How-to-do-it lessons for beginners as well as those already in the trade. Thorough self-instruction training in American and Swiss watches, clocks. Contains a wealth of helpful photos, drawings, diagrams, charts, etc. Only \$4.95 for everything, complete. Satisfaction or refund guaranteed. Mail no-risk coupon below.



practical RADIO servicing

SELF-INSTRUCTION COURSE

Teaches you the practical side of radio... repair, adjustment, operation, alteration, trouble-shooting. No previous knowledge necessary. Prepare to set up a shop of your own—or train for the big industrial electronics field. Simplified lessons, including mathematics, review questions, problems, answers. Up-to-date! Only \$3.95, complete. Money-back guarantee. Use coupon below.



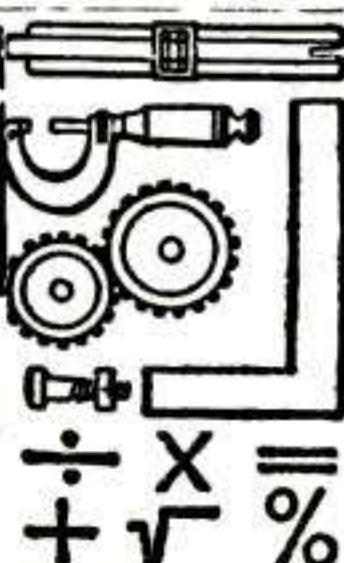
REAL ESTATE BUSINESS

The foundation of all wealth is land! Train yourself for a career in this booming profession. Here is the information you need on how to get started and how to get ahead in real estate. Includes instructions in appraisals, valuations, management, investments, practical real estate operating, low cost housing, the law on real estate transactions including legal forms, etc., salesmanship, and many other subjects a successful real estate man must know. Strictly up-to-date. Complete, only \$6.95. Money-back guarantee. Use No-Risk coupon below.



Short-Cut Mathematics COMBINED WITH Practical Mechanics Simplified

Be a "master mind." Learn how to juggle figures, do baffling tricks with numbers. Add long columns of figures this lightning-quick, short-cut way. Multiply 4 figures by 4 figures without old-fashioned multiplication. Here are speedy, simplified systems used by stage "wizards," expert accountants, engineers. Only \$1.49. Course includes illustrations, problems, answers. Mail coupon below!



COMPLETE BLUEPRINT READING COURSE

Interesting, simplified self-instruction lessons for builders, mechanics, electricians, plumbers, welders, carpenters, automotive & aviation workers, etc. 24 volumes include over 600 actual blueprints, diagrams, other instructive step-by-step pictures. Unusual bargain for any practical man. Complete, only \$6.95, postpaid. Satisfaction or refund. Coupon below.



BUILD IT YOURSELF

Be a practical handyman. Save time and money with these professional Tricks-of-the-Trade. Carpentry made easy! New self-instruction course in one handy volume, complete with full page photographs, diagrams, etc. Teaches woodworking, painting & decorating, upholstering, power tools, cabinet making, etc. Full price only \$1.98. Money-back Guarantee. Mail coupon today!



Mail This No-Risk Coupon—Quick Action!

NELSON-HALL Co., 1139 S. Wabash Ave., Dept. L-01, Chicago 5, Ill.

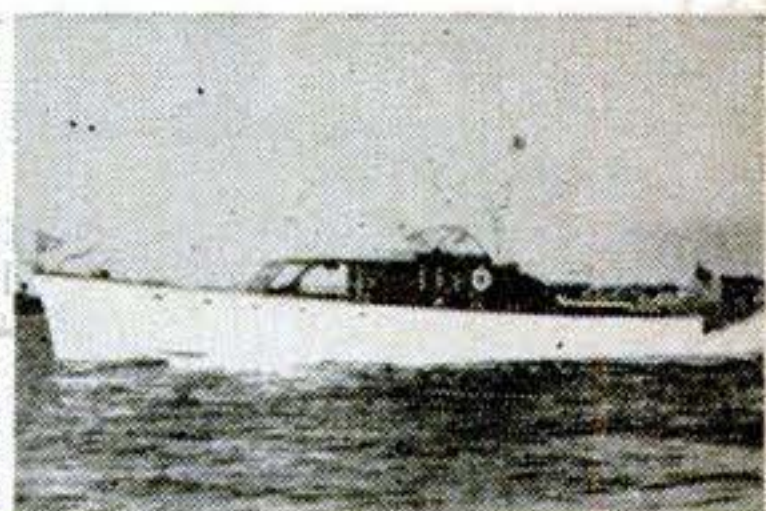
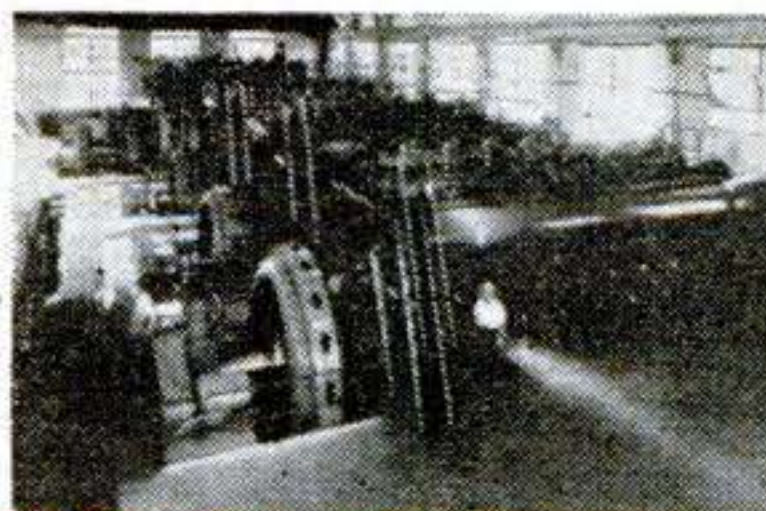
Please rush me the items I am checking below. It is understood that if I am not 100% satisfied I will send the material back within 10 days and you will make full immediate refund, without question or quibble.

- | | | |
|--------------------------|---------------------------------|--------|
| ☐ | Watch & Clock Repairing..... | \$4.95 |
| ☐ | Locksmithing & Key Making..... | 3.95 |
| ☐ | Practical Radio Servicing..... | 3.95 |
| ☐ | Real Estate Business..... | 6.95 |
| ☐ | Short-Cut Mathematics..... | 1.49 |
| ☐ | Blueprint Reading Course..... | 6.95 |
| ☐ | Build It Yourself..... | 1.98 |
| ☐ | Apartment House Management..... | 5.95 |
| ☐ | Jewelers' Encyclopedia..... | 1.69 |
| ☐ | How to Sell Life Insurance..... | 6.95 |
| ☐ | Complete Shorthand Course..... | 4.95 |

☐ I enclose \$..... in full payment. Ship postpaid.
☐ Ship COD for \$..... plus postage and COD charges.

Name _____
Address _____

LEARN **DIESEL** THE QUICK, EASY WAY



THE FAMOUS HEMPHILL WAY!

Wherever Diesels are used, the name "HEMPHILL" is famous. It stands for TRAINED MEN—men who *know* Diesel. Many trained Diesel graduates of Hemphill Schools are successfully engaged in work where their Diesel training is "paying off." Perhaps they are assembling Caterpillar Tractors, or servicing Cummins-powered trucks, or installing and maintaining General Motors' Diesels. Perhaps they are working with these and other makes of Diesel engines in trains, ships, drilling rigs, sawmills or construction equipment—but no matter what the Diesel job, Hemphill trained men

have the "know how" to handle it.

Prepare YOURSELF for the great industrial swing to Diesel power which is now here. Get complete details of Hemphill Diesel training now!

STUDY AT HOME—you can learn Diesel at home, quickly and easily, in your spare time. Hemphill Home-Study lessons are fully illustrated, easy to understand—have helped many to success. Mail coupon below for complete details and free booklet "March of Diesel."

AUTOMOTIVE TUNE-UP SPECIALIST TRAINING
available in Los Angeles. See coupon.

**APPROVED for VETERANS
and NON-VETERANS**

RESIDENT SCHOOLS LOCATED AT:

NEW YORK	LOS ANGELES	MEMPHIS
31-28 Queens Blvd.	1601 S. Western Ave.	311 S. Main St.
Long Island 1, N. Y.	Los Angeles 6, Calif.	Memphis 3, Tenn.

34 weeks practical training. If you would prefer to train at one of these three schools, indicate by check on coupon.

MAIL COUPON NOW!

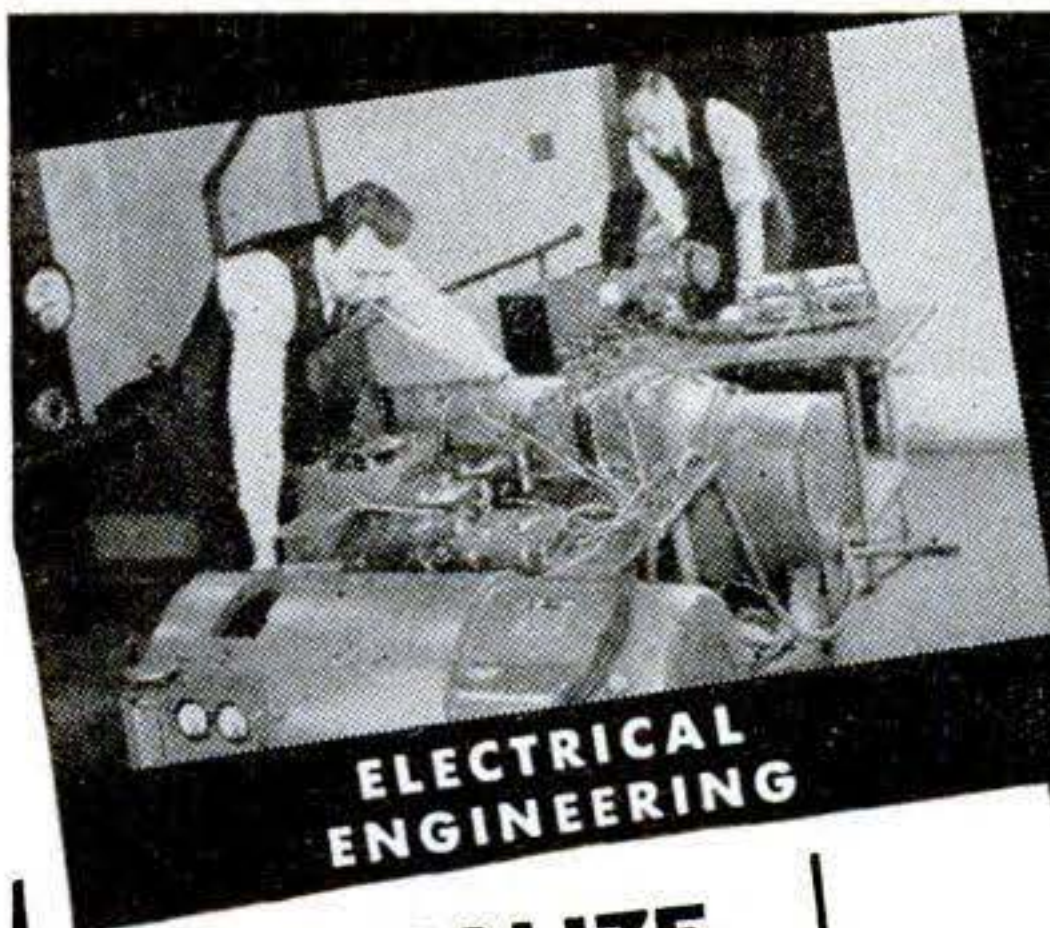
HEMPHILL DIESEL AND AUTOMOTIVE SCHOOLS

Administrative Office: 1601 South Western Ave., Dept. PS-118

Los Angeles 6, California

Gentlemen: Please send me FREE BOOKLET and information on your Diesel Courses. I am interested in Home Study ☐ Resident School ☐ at New York ☐ Memphis ☐ Los Angeles ☐ (Check school desired.) Automotive Tune-Up ☐

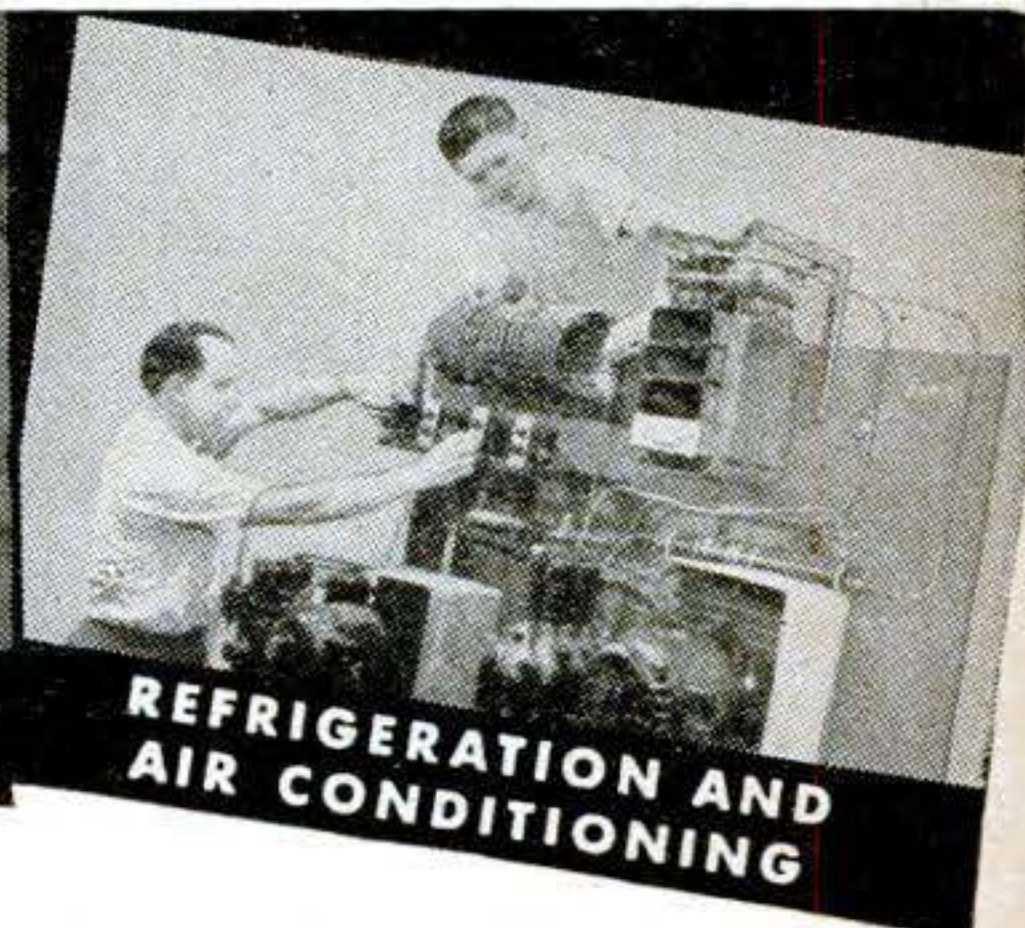
Name _____ Age _____
Street _____ Zone _____
City _____ State _____
Veteran _____ Non-Veteran _____



**ELECTRICAL
ENGINEERING**



ELECTRONICS



**REFRIGERATION AND
AIR CONDITIONING**

SPECIALIZE In 6 Months to 3 Years COURSES

SERVICE

6 to 12 Months

- Electricity
- Welding
- Refrigeration
- Heating

TECHNICIAN

1 to 2 Years

- Electrotechnics
- Radio and Television
- Electronics
- Refrigeration, Heating, and Air Conditioning

PROFESSIONAL

3 Years

- Electrical Engineering Bachelor of Science Degree
Major in Machinery or Electronics



PRACTICAL TECHNICAL TRAINING

Train for a substantial career in industry . . . or a business of your own. Our time-tested Concentric System enables you to build your career step by step. Each 6-month course is complete in itself, yet prepares you for advanced courses. Stay as long as circumstances permit—until you reach the top step in your technical training. More than 1,538 students now enrolled from 48 states and 13 overseas countries. Faculty of 72 specialists. World-wide alumni counselor committee. Terms start January, April, July. **SEND COUPON TODAY!**

MILWAUKEE SCHOOL OF ENGINEERING

"A Technical Institute—Founded 1903"

Milwaukee School of Engineering
Dept. PS-1148, N. Broadway and E. State, Milwaukee, Wis.
Without obligation, send me free booklet "Career Building" and more details on course

In _____
Name _____ Age _____
Address _____
City _____ State _____

Don't Envy The PLUMBER-Be One

Make \$15 to \$50 a Day
(and work every day)

Every skilled workman will tell you Plumbers have the best of it. WINTER and SUMMER the Plumber is busy at top wages. No skilled Plumber is ever out of a job . . . compare his opportunities with any trade, and decide where your opportunity is.



Own Your Own PLUMBING BUSINESS

No other business offers you the opportunity of starting in your own business, and making good profits, with little investment other than Universal's training and a kit of tools.

JOURNEYMAN PLUMBER Gets Good Salary

Master Plumbers own their own shop. A Journeyman works for a Master. With Universal training a journeyman can depend on high wages from the start.

FREE

DETAILS SHOW
YOU HOW TO START

You can start now to success as a plumber by simply filling out the coupon and mailing it . . . or just write Universal Plumbing School, 839 Holmes, Kansas City, Mo. FREE details showing how will be sent by return mail.

Plumbing, to the man with know how, means profit. Investigate Universal's unique "Shop Method" system . . . This system, developed over a quarter century ago by a master plumber, offers you the opportunity to quickly get into the plumbing business. This is not a "war born school" . . . but a plumbing school developed and operated by plumbers since 1923.

BE A PLUMBER In Just 32 Weeks

Now, just 32 weeks of intensive training equips you to be a plumber. No need ever serve an apprenticeship. Don't envy the plumber's big profits . . . enjoy them.

System Shows How With Tools . . . Not Books

Universal's highly developed method makes plumbers by a special developed system showing how to use plumbing tools . . . not books. Every instructor is a Licensed Master Plumber capable of showing every trick of the trade . . . Lead Work . . . Blueprint for plan reading, etc. This business offers a wonderful opportunity for the man who likes to work with tools.

Over 7,000 Successful Plumbers Recommend This School

This system has made more than 7,000 plumbers. Each will testify it was the Universal Plumbing School that started him on the road to profits. Investigate our past performance . . . then decide. Universal is the largest and only school in America devoted exclusively to plumbing. It was established in 1923 under a system developed by a plumber and is owned and operated by licensed plumbers. Don't waste your time looking over "war born schools" . . . investigate this system . . . then get into the profitable plumbing business.

JUST MAIL COUPON

Send me FREE details about the plumbing business and tell me how to make profits as a plumber . . . I understand there is no obligation.

Name _____
Address _____
City _____ State _____

G. I. Approved. Established 1923

UNIVERSAL PLUMBING SCHOOL

839A HOLMES

KANSAS CITY, MO.

GENUINE SWISS 2-Push-Button CHRONOGRAPH WRIST WATCH



\$7.95
ONLY

A Sensationally low price for such a precision time-piece . . . A WRIST WATCH and STOP WATCH in one!

IT HAS EVERYTHING!

Note These Features . . .

- It's a TIMEKEEPER!
- It's a STOP WATCH!
- It MEASURES DISTANCE
- It MEASURES SPEED of Airplanes, Cars, Race Horses, etc.

It has Sweep Second Hand, Chrome Case, Precision Workmanship.

EXPANSION BRACELET of matching stainless steel 49c additional.

SEND NO MONEY!

Rush order today. Pay postman only \$7.95 plus 10% tax and postage. Satisfaction guaranteed or money refunded if returned within 10 days.

HARVEY SALES, Dept. 121
4916 N. Albany, Chicago 25, Ill.



Drafting PAYS BIG

Learn in Spare Time—At Home or at Allied School in Chicago

KEY POSITIONS OPEN IN INDUSTRY

- Mechanical Drafting
- Structural Drafting
- Aircraft Drafting
- Tool and Die Making
- Tool and Die Designing
- Machinist Trade
- Product Designing
- Product Illustrating

Train Now!

in
Nationally Known
Fully Approved
School and
Endorsed by
Industry

Established
in 1928
FREE
EMPLOYMENT
SERVICE

Approved for Civilians
and Veterans

Write For Catalog—A 1c Postcard will do

ALLIED SCHOOL OF MECHANICAL TRADES

1338-1340-1342 So. Michigan Ave.

4411 Allied Bldg.

CHICAGO 5, ILL.

IT COST ME MONEY
TO FORGET!

...This Doesn't Happen
If You Use *Memindex*



MEMINDEX—the famous memory method and personal systematizer, is credited by thousands of successful persons with speeding their rise to the top. Memindex keeps all data on handy, cleverly indexed and dated cards—today's always visible. Fine leather POCKET CASE organizes your daily memos—hand-some DESK UNIT keeps permanent records for you.

No transcribing. Worth 1000 times its small cost to salesmen, business and professional men, hobbyists and social leaders. Outfits \$5.75 and up.

FREE Dated Cards for balance of 1948 with your 1949 Memindex. Write for Catalog describing complete line of reminder specialties.



WILSON MEMINDEX CO.
Dept. M, 149 Carter St., Rochester 5, N. Y.

Now YOU-TOO-Can Be a "WHIZ" on ANY AUTO REPAIR JOB!



"Motor's Manual paid for itself on the first 2 jobs, and saved me valuable time by eliminating guess work."—W. SCHROP, Ohio



"Instructions so clear, have no trouble learning anything about any car. Now working as mechanic in big plant."—S.A.M. ORDONEZ, Cal.



"Fixed motor another mechanic had worked on half a day. With your Manual, I did it in 30 minutes!"—C. AUBERRY, Tenn.



"So complete, easy to understand—have done jobs with Manual I would not have attempted without it."—C. L. VAN-ERSTROM, Mich.

MoToR's AUTO REPAIR MANUAL Is Showing Thousands of Men How to Handle ANY Job on ANY Car—Faster and Easier! Now Let It Go To Work For YOU!

FREE-7 Day Offer

HERE'S the book YOU need to "Whiz through" every auto repair job—including those "ornery," extra-hard ones that give other mechanics such a "headache"!

THOUSANDS of men like the four above are letting MoToR's AUTO REPAIR MANUAL help them "lick" even the toughest repair problems—in LESS TIME, with LESS work and MORE profits than ever before!

Complete "How-To-Do-It"

Now let these 200,000 factory-correct instructions and facts, 1700 "how-to-do-it" pictures, 200 "quick-check" charts and tables, go to work for YOU! With them you

can repair anything from carburetor to rear end, Ford to Cadillac, shaky '35 model to shining '48—quickly, easily, right!

Just look up make, model, job in quick index; then let official instructions, "boiled down" from 150 auto manufacturers' factory shop manuals, show you how, step-by-step! Sturdy binding, 8½ x 11 inches, over 700 pages.

SEND NO MONEY

Find out for yourself how this book can pay for itself first few days you use it. Try it FREE 7 days! Just mail coupon. Pay postman nothing. Put Manual to actual test. Then, if not entirely satisfied with it, return book in 7 days, pay nothing. Mail coupon today! MoToR Book Dept., Desk 2N, 572 Madison Ave., New York 22, New York.

Every Job on Every Car Built Since 1935!

Nearly 200,000 service and repair facts on:
American Bantam • Auburn • Austin • Buick • Cadillac • Chevrolet • Chrysler • Cord • Crosley • DeSoto • Dodge • Ford • Frazer • Graham • Hudson • Hupmobile • Kaiser • Lafayette • LaSalle • Lincoln • Lincoln Zephyr • Mercury • Nash • Oldsmobile • Packard • Pierce Arrow • Plymouth • Pontiac • Reo • Studebaker • Terraplane • Willys.

700 big pages; including 70 pages of carburetor text, charts, illustrations covering all models. Over 200 charts, tables: Tune-up Chart; Valve Measurements; Torque Wrench Reading; Starting Motor; Engine Clearances; Generator; Body Service; Dash Gauges; Brake Specifications; Front End Measurements, etc., Engines; Electric, Fuel,



Cooling, Lubricating Systems; Transmissions; Universals; Front Ends; Wheels; Rear Ends, etc.

MoToR Published by MoToR, The Leading Automotive Business Magazine. MoToR's manuals assure high standards of repair work.

Same FREE 7-Day Offer Applies on MoToR's Truck Repair Manual

For mechanics, truck specialists, service stations, fleet owners. Covers EVERY job on EVERY truck made since 1936! 1400 pictures, 952 pages, 300,000 facts. Used by Armed Forces. Warranted to contain every essential fact you need to know. Strong binding size 8½ x 11.

Covers all types Gasoline Engines; Diesels and Hesselmans. Fuel Sys-

tems, Governors, Lubrication Systems, Ignition Systems, Starters, Generators, Clutches, Transmissions, Axles, Torque Dividers, Transfer Cases, Brakes, Steering, etc., etc.

Also services buses, farm and industrial tractors, contractor, and road building equipment, stationary power machinery, etc. (on all parts described in Manual.)

Offered on same FREE 7-Day examination as Auto Repair Manual. Check box in coupon at right.

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MoToR Book Dept., Desk 2N, 572 Madison Ave., N. Y. 22

Rush to me at once: (Check box opposite book you want)

☐ MoToR's AUTO REPAIR MANUAL. If O.K. I will remit \$1 in 7 days, (plus 35c delivery charge), then \$2 monthly for 2 months, and a final payment of 95c a month later. (Foreign price, remit \$8 cash with order.)

☐ MoToR's TRUCK REPAIR MANUAL. (Described at left.) If O.K. I will remit \$2 in 7 days, and \$2 monthly for 3 months, plus 35c delivery charge with final payment. Otherwise I will return book postpaid in 7 days. (Foreign price, remit \$10 cash with order.)

Print Name.....Age.....

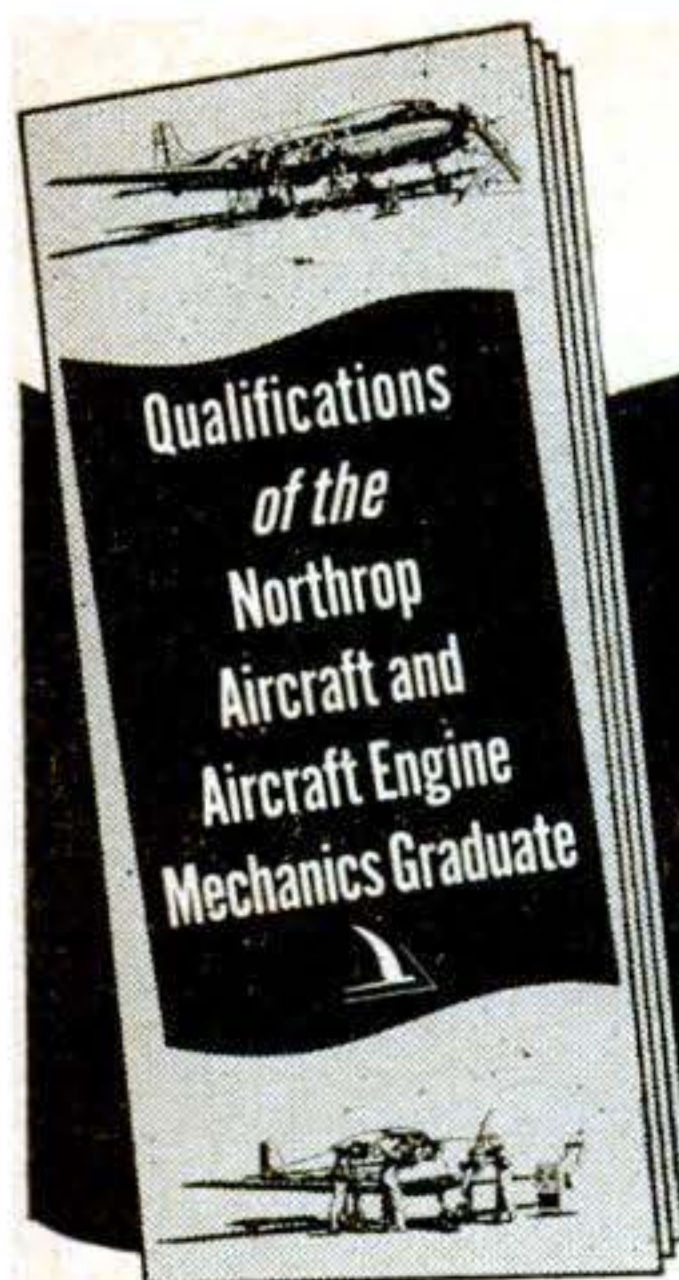
Print Address.....

City.....Zone No. (if any).....

State.....Occupation.....

☐ Check box and SAVE 35c delivery charge by enclosing WITH COUPON entire payment of \$5.95 for Auto Repair Manual (or \$8.00 for Truck Repair Manual). Same 7-day return-refund privilege applies.





Get This
Free Booklet

Learn
why it pays
to be a
Northrop-Trained
A & E
Mechanic

This booklet tells future employers of *Northrop* graduates about the *Northrop-trained* A & E Mechanic's superior qualifications. Our Graduate Placement Department has placed it in the hands of over 5000 airlines, repair stations, flying schools, airports, and aircraft sales agencies; and executives of aircraft, engine, and propeller manufacturers.

This booklet will tell YOU the important advantages YOU can enjoy during your training, on entering Aviation, and all through your career. Here are the answers to: why the *Northrop-trained* A & E mechanic is in demand—why *Northrop* graduates hold good jobs with many leading aviation firms—how *Northrop* training prepares men for better starting jobs, faster advancement, successful careers.

Read this description of training at a technical institute that is part of a famous aircraft company, a school in the midst of important engineering, manufacturing, and maintenance work—where you get many advantages that make your first job simply a continuation of the very same practical duties you learned and performed during your *Northrop* training.

Get this booklet—if you are interested in Aviation—if you want to make the most of Aviation's big opportunities. Send the coupon for your free copy.



NORTHROP AERONAUTICAL INSTITUTE

Division of Northrop Aircraft, Inc.

James L. McKinley, Managing Director

1525 E. Broadway, Hawthorne, Los Angeles County, Calif.

APPROVED FOR VETERANS

NORTHROP AERONAUTICAL INSTITUTE

1525 E. Broadway, Hawthorne, Los Angeles County, Calif.

Please send my free copy of the booklet, "Qualifications of the Northrop Aircraft and Aircraft Engine Mechanics Graduate," also the Institute catalog and complete information on Northrop training, including starting dates of classes. I am interested in:

☐ Aircraft and Engine Mechanics ☐ Aeronautical Engineering

Name _____

Address _____

Age _____

City _____

Zone _____

State _____

Check one: ☐ Veteran ☐ Non-Veteran

START A BUSINESS AT HOME...

Like John Lehman, Who Says:

"The complete Fyr-Fyter extinguisher line gives me a steady income and real independence."



Yes, capable men like John Lehman will find an outstanding opportunity with Fyr-Fyter. You can be your own boss... operate in your own town and vicinity... build a permanent, steady income. No capital needed. We carry accounts, make deliveries, pay profits weekly. Thousands of prospects due to the vast need for fire protection.

Write for FREE BOOK

Get details on Fyr-Fyter's famous sales kit... facts on the complete, Underwriters' approved Fyr-Fyter line... how you earn while you learn. Write today! No obligation.

Fine Business
for men past 40.

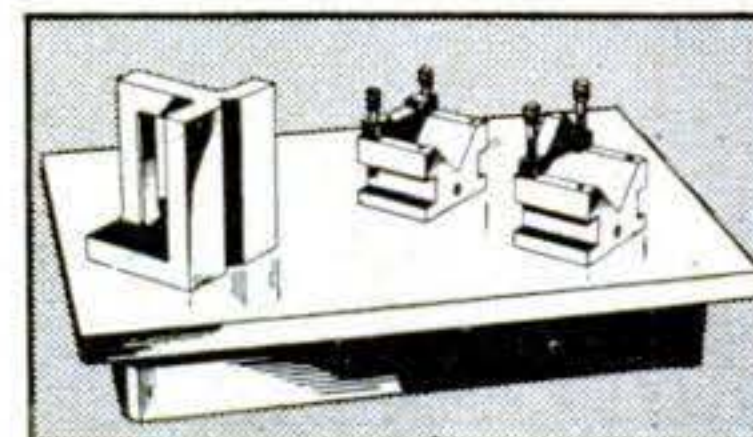


FYR-FYTER CO. Dept. 92-47, Dayton, Ohio

Surface Plate, Angle Plate, V-Blocks

SURFACE PLATE for laying out, etc. Precision ground to .001". 12" x 17" x 3", top 3/4" thick. **\$37.50**

ANGLE PLATE. Precision ground. 3-1/4" x 3-1/4" x 4-1/4" **\$20**



V-BLOCKS for holding cylindrical parts. Precision ground. 1-15/16" x 2-15/16" x 2-1/4". Cap. 1/4" to 2" round. Per matched pair **\$32**

Prices f. o. b. factory

SOUTH BEND LATHE WORKS
456A E. Madison St.
South Bend 22, Indiana

WALL TENT 9'x9' waterproof canvas, front and back windows, 3'6" wall, open at back. Ends 8' high. Only **\$19.95**

CANVAS COVERS Waterproof tarpaulins, war surplus (Used), perfect condition. Originally made for tents. Approx. 5'x8'. Two buttoned together make approx. 80 sq. ft. Complete with buttons attached. Suitable for use as canvas dams, hay covers, truck covers, machinery and equipment covers, etc. Packed in bales of 30, priced 30 covers, **\$1.25 ea.**; 15 covers, **\$1.50 ea.** Less than 15, **\$1.75 ea.** All FOB, Kansas City.

AMERICAN SUPPLY CO.

329 W. 5th

Dept. P.S.

Kansas City, Mo.

Send for this FREE BOOK on

RHEUMATISM

ARTHRITIS • NEURITIS • SCIATICA



If you suffer the agonizing pains of these diseases when the usual remedies have failed, learn about a specialized system proven for treating. This marvelous treatment is completely explained in the Ball Clinic's **FREE BOOK. No Obligation. Write Today.** Ball Clinic, Dept. 36, Excelsior Springs, Mo.

LAFAYETTE CONCORD KIT-QUARTERS FOR RADIO BEGINNERS HAMS and PROFESSIONALS AMERICA'S GREATEST RADIO VALUES



here's a swell gift: ELECTRIC HAND DRILL KIT ONLY \$19⁹⁵

Kit contains 1/4" capacity drill with universal type 110-120 V. AC-DC motor. Free chuck speed 1100 rpm. Balanced saw grip handle puts "in line" pressure on drill for fewer breakages. Thumb control switch located on top of handle. Metal case holds drill and 20 "mechanic's length" high grade steel twist drills, sizes up to 1/4". 10 for steel and iron, 10 for wood. No. 18N15765P. 8 lbs. **\$19⁹⁵**



6 tube, 2 band kit BUILD IT YOURSELF

Has a freq. range from 550-1600 kc and s.w. band from 7-16 mc. Two band dial. Three controls. Circuit includes untuned stage of RF amplification. 12SK7 as RF amplifier, a 12SA7 oscillator-converter, a 12SK7 IF amplifier, a 12SQ7 as a det., AVC, 1st Audio Amplifier, 35L6GT power output, and a 35Z5 rectifier. Kit includes all parts and cabinet except tubes, wire and solder. No. 32N24542P-AC-DC. **\$17⁹⁵**

NEW MICRO-GROOVE LP PICKUP

For the new long-playing records, crystal phono pickup for reproduction of lateral cut long playing microgroove records at 33 1/3 rpm. Excellent frequency response for voice and music. Output volt. approx. 1 volt. Low tracking force. No. 99N3577P Wt. 12 oz. **\$4⁹⁵**

idea of the year... PORTABLE BICYCLE RADIO for only \$19⁹⁵



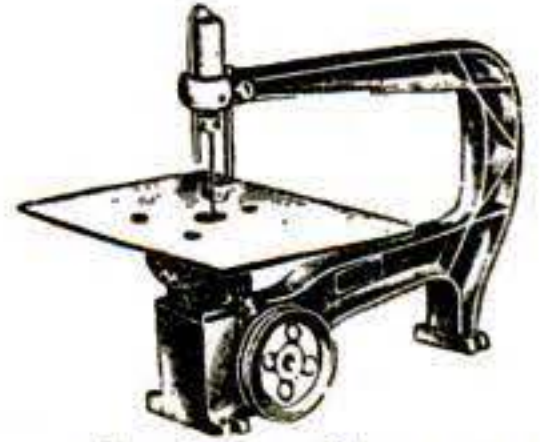
Battery operated. Can be easily mounted or carried as a personal. Supplied complete with all bicycle mounting hardware and telescopic antenna which plugs into radio. Slide rule dial. Vernier tuning. Full size Alnico #5 speaker. Operates on inexpensive flashlight cells and standard 67 1/2 volt "B" battery. Attached handle. Lightweight. Case beautifully finished. Anti-theft feature. Size: 7 1/4 x 4 1/4 x 3 1/2". 3 lbs. 3 ounces. Battery kit \$1.84 No. 1N420P **\$19⁹⁵**

LAFAYETTE-CONCORD

100 Sixth Avenue, New York
901 W. Jackson Blvd., Chicago
110 Federal St., Boston
229 W. Madison St., Chicago
265 Peachtree St., Atlanta
24 Central Ave., Newark
542 E. Fordham Rd., Bronx

here's your chance to get a professional JIG SAW at only \$13⁴⁵

Highly-polished, rust-proof, extra-strong aluminum construction. Only 1/3 the weight of the usual cast-iron power tool. Includes many expensive machine features: "Oilite" bronze bearings; roller bearing saw guide; built-in blower; sturdy, accurate protractor to set or reset table to any desired angle quickly. Blade may be turned to any angle for ripping. 14" throat will cut work up to 2" thick on table 9"x12". 720 strokes. No. 18N15736P-Wt. 12 1/2 lbs. **\$13⁴⁵**



BEST SPEAKER BUY EVER

Grab up a couple at this amazingly low price. They're top quality 10" PM speakers. 4.8 oz. Alnico V magnet. Voice coil impedance 3.2 ohms. Up to a booming 8 watt capacity. Ideal for radios, etc. No. 99N7019P.



ELECTRIC MOTOR KIT motorize your models

A complete set of precision-made parts for building a swell electric motor. Simple, vividly illustrated instruction book with 25 pages of "whys" and "hows" of electricity, television, radar and atomic energy. Hours of fun. No. 32N24455P complete, everything including two batteries. Only **\$2⁹⁵**

FREE BIGGEST BOOK IN RADIO 180 PAGES



Listen - how would you feel if you opened your mail box this A.M. and found an envelope stuffed with crisp new fives and tens? That's how veteran bargain hunters react when they open their copies of the giant new Lafayette-Concord 1949 Catalog, now in the mails! It's the next best thing to a bankbook: 180 pages crammed with sensational "buys," made possible by the purchasing power of the largest radio supply organization in the world-plus everything in famous brands! There's hardly a page without some real "find" in TV, Hi-Fi, Ham, AM & FM Radios, P.A., Test Equipment, Parts, Tools, etc. If you want the best there is, shop from this catalog, or drop into one of our stores.

RUSH THIS COUPON AT ONCE

LAFAYETTE-CONCORD, DEPT. KK8
100 Sixth Ave., New York 13
901 W. Jackson Blvd., Chicago 7
265 Peachtree St., Atlanta 3

MAIL THE COUPON NOW

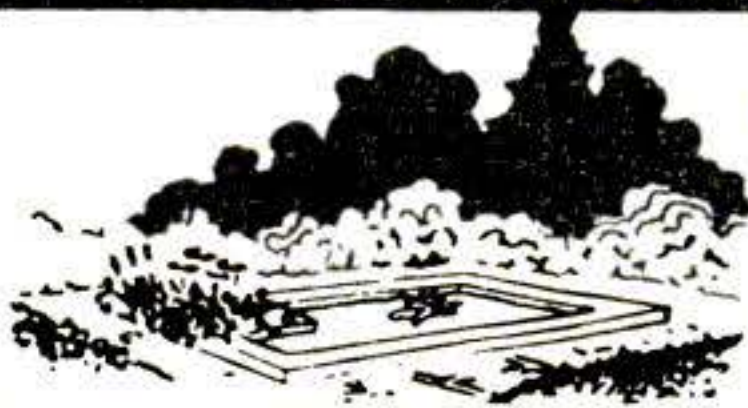
☐ Please rush FREE catalog No. 89.
☐ Send Free Xmas Gift Catalog
☐ I enclose \$..... Please fill attached order. Shipping charges extra.

Name.....
Address.....
City..... Zone..... State.....

LEARN TO

- DESIGN
- INSTALL
- MAINTAIN

GARDENS & PARKS



Read what students say:

J. M., Brooklyn, N. Y. writes: "—my income from a small landscaping business has just been short of spectacular." W. P., Florida, writes: "—course aided me in no small way to secure position as Assistant Superintendent of Parks." F. L., Calif., writes: "Thanks to your lessons — I won a top staff job against stiff competition." D. S., Michigan, writes: "I am grateful for the fine course and it has certainly greatly improved the outlook for my nursery for the future."

ORNAMENTAL HORTICULTURE

A thorough, constructive home study training for employment or advancement in Nursery Operations, Park Supervision or maintenance, Landscape Designing or Landscape Gardening. Our 3 way Plan shows you how to start your own business, get a better job, or earn extra money in spare time. Send for Free information.

APPROVED FOR VETERANS

NATIONAL LANDSCAPE INSTITUTE

310 S. Robertson Blvd., Dept. PS-11. Los Angeles 36

Dear Sirs: Please send me, without obligation, complete information about your course.

Name _____

Address _____

City _____ State _____

VETERAN ☐ NON-VETERAN ☐

Increasing your hold on your job and giving yourself a chance for advancement

Few men deliberately plan to work persistently on self-improvement. If progress comes naturally, they're happy; if it doesn't, they worry or ignore the situation. Yet it is possible to pay attention to self-improvement with considerable hope of success. A noticeable degree of advancement is practically assured any one who will make an intelligent and persistent effort. Thousands of men have proved this for themselves with:



The Croft Library of Practical Electricity

The Croft Library is a complete electrical educator. It is founded on practice — on 20 years of shirt-sleeve experience — on work as it is actually done. It is jammed from cover to cover with the kind of hard-headed facts you want. Written so that the beginner can easily understand it, yet so sound, so thorough, that it is the daily guide of 59,000 highly paid electrical workers and engineers. Croft tells you the things you need to know about motors, generators, armatures, commutators, transformers, circuits, switchboards, distribution systems — electrical machinery of every type — wiring for light and power — wiring of finished buildings — underwriters and municipal requirements — illumination in its every phase — the most improved methods of lighting lamps — and lamp effects, etc. — how to do a complete job, from planning it, to completion.

No money down — easy payments

Fill in and mail the coupon attached and we will send you the entire set of seven volumes for ten days' examination on approval. We take all the risk — you assume no obligation. If you decide to keep the books, send \$3.50 in ten days and the balance at the rate of \$4.00 a month. Send the coupon NOW and see the books for yourself.

McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y.

Send me for ten days' examination on approval the Croft Library of Practical Electricity, 7 vols. If satisfactory I will send you \$3.50 in 10 days and \$4.00 monthly until the price of \$19.50 is paid. If not wanted, I will return the books postpaid.

Name _____

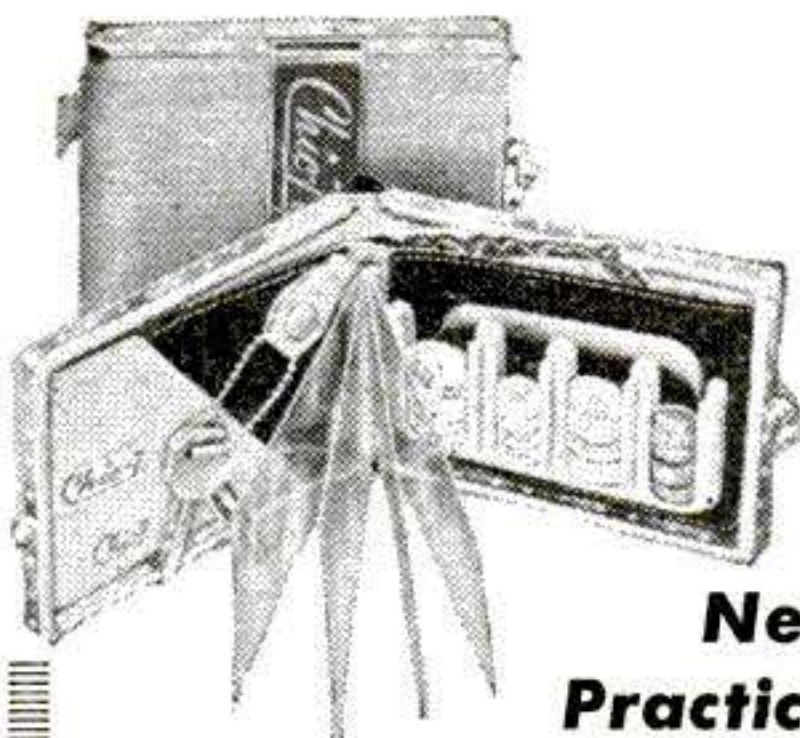
Home Address _____

City and State _____

Company _____

Position _____ PSM-11-48

The Handiest Thing a Woman Can Have! "Chic 7"



New — Smart
Practical — Luxurious

Now, in one "hand sized" purse you have • Bill-fold • Coin Holder • Removable Key Chain • Identification Window • Stamp Compartment • Card and Ticket Pocket • Removable Transparent Viewers for 8 photos. Enjoy the pleasure of keeping your 7 "basics" together in this charming creation. Made of luxurious genuine leather in 4 of fashion's most glamorous colors; Emerald Green, China Red, Smoke Brown, Jet Black. Ideal for use in handbag or alone.

NOTE TO BOY FRIENDS, HUSBANDS, BOSSES: The gift every woman appreciates. Special quantity discount of 5% on orders for 12 or more.

C.O.D. only \$2.98 tax included plus postage. Send check or money order and save postage.

Money back if not satisfied.

ERMO CO. Dept. B, 507 Fifth Ave.
New York 17, N. Y.

EXCITING FILMS

Thrilling Home Movies of all types.

Send only One Dollar for Super Short Subject "EXCITING STARS".

Order NOW from —

Dept. P.S.

EXCITING FILMS

1071 El Centro, Hollywood, Calif.

Check Size: 8mm ☐ 16mm ☐ Sound ☐



AMAZING NEW HOLLYWOOD PLAN

Yes, YOU can draw GIRLS, CARS, FRIENDS and even MAGAZINE COVERS. It's so simple, no matter what your age. Many artists make more than \$150.00 per week in advertising and cartoons. Be your own boss, draw for money anywhere. Our Commercial Artists will teach you the secrets from HOLLYWOOD. Drawing materials furnished. Be a success. Write NOW for free details

HOLLYWOOD SCHOOL OF ART

DIVISION OF AXELSON STUDIOS

6533 Hollywood Blvd.
Hollywood 28, Calif.

Name _____

Address _____

City _____ Zone _____ State _____

It Will Pay You to Read These Vital Facts about **YOUR FUTURE** in **REFRIGERATION** **AND AIR CONDITIONING**

This open letter has only one purpose—to help you decide if Refrigeration and Air Conditioning can give you the kind of future you want. If you are looking for better pay, real job security, steady advancement—perhaps a business of your own some day—you're the man who will go places **FAST** in this thriving, fast growing industry!

Good Jobs Open Now

Many fine jobs are open **NOW** in Refrigeration and Air Conditioning for men with proper training. They should have a real liking for machinery; and they shouldn't be worried about getting their hands dirty. These men constantly will be meeting up with different kinds of work—installing, repairing, servicing, maintaining and rebuilding Refrigeration and Air Conditioning equipment. There won't be any dull moments—and every day will seem more interesting than the last.

Does this sound good to you? If it does, read every word that follows:

Start with Home Study

You can get the training you need to handle a good paying job in this fascinating field in a few short months. The Industrial Training Institute—America's foremost school of practical training—will start preparing you at home in your spare time. You can keep your present job and income while training. You can train as fast or as slowly as you wish—ITI training is geared completely to your own personal needs. This Home Spare-Time Study is the **first step** in the famous ITI 2-Way Training Plan.

Everything Easy to Grasp

Your ITI Home Study lesson Work Sheets are so practical and down-to-earth that you can do many profitable service jobs while you're still learning. This is a fine opportunity to earn while you learn—and get priceless practical experience at the same time.

WORK IN HUGE SHOPS

Then step Number 2! Just as soon as you finish the Home Study part of your ITI training, we pay your transportation to Chicago where your training continues in our giant ITI shops for **FOUR FULL WEEKS**. Here you actually work with every kind of modern Refrigeration, Air Conditioning and Heating equipment. You see remarkable demonstrations that make every point crystal clear. You get the equivalent of years of on-the-job experience—including a complete course of training in the ITI Experimental Home—the amazing building that contains the secrets of Air Cooling, Heating and Conditioning.

HELP IN FINDING A JOB

With this training—the most practical and complete ever offered—you graduate from ITI ready to handle any practical job in the industry. But we don't stop there. The ITI Job Placement Help Department will do everything possible to help you find the kind of job you want in the locality you want to work. And ITI graduates may use this service at any time—even years after finishing school.

30 Years of Training Experience

ITI has been training men for industry since 1916—over 32 years of successful and useful experience. ITI graduates all over the world fill key jobs at top pay. These men have advanced steadily to success because their ITI training gave them a flying start. Today specialized training is absolutely essential to advancement and bigger pay. ITI, with its five large buildings, over \$500,000.00 worth of training facilities and equipment and large staff, is ready to give you training that's **best** of all for you—and none but the best will do! You don't need any special schooling or experience. If you are ambitious, mechanically inclined and have the will to win—you can master ITI training quickly and easily. There's no complicated theory, no dull mathematics. The ITI course is 100% practical—built for the practical man by practical men.

Mail Coupon for FREE BOOK!

Find out about ITI training today. Just fill in and mail the coupon below. We'll rush you the big **FREE ITI book**, "Your Future in Refrigeration and Air Conditioning" with full facts about ITI training. Take this first step toward success and big pay **NOW**. There's no obligation.

VETERANS: ITI residence training is fully approved under the G. I. Bill.

Get the Facts → → → →

MAIL COUPON TODAY!


INDUSTRIAL TRAINING INSTITUTE
Formerly the L. L. Cooke School of Electricity & Refrigeration & Air Conditioning Institute
Dept. L-2 2150 LAWRENCE AVE., CHICAGO 25, ILL.

MR. C. H. SMITH, President
INDUSTRIAL TRAINING INSTITUTE, Dept. L-2,
2150 Lawrence Ave., Chicago 25, Ill.

Please send me the **FREE ITI book**, "Your Future in Refrigeration and Air Conditioning" and full information about the opportunities for trained men in this fast growing field. I understand I'm under no obligation.

Name _____

Address _____ Age _____

City & Zone _____ State _____

Are you a veteran? _____

Have an OFFICE of YOUR OWN!

LEARN NEW PROFITABLE PROFESSION
At Home in 60 Days, Men & Women, 18 to 70!

Earnings of men and women in this profession run as high as \$5,000-\$15,000 yearly. Others make good money in spare time. Little money needed to start. A business where your earnings begin sooner. Easy to learn. No selling or goods to buy. No experience necessary. A depression-proof business. A course of action to guide you step by step as you earn. All 53 lessons sent at once to use as operating manuals. Easy terms. Diploma. Money-back agreement. Write for **FREE BULLETIN**.

FRANKLIN CREDIT SCHOOL
Dept. 71-M ROANOKE 7, VIRGINIA

Be Your Own Boss and the Boss of Others. Be Respected. Meet Interesting People.



BY MAIL in
Easy Lessons

SHORTHAND in 6 Weeks at Home

Famous Speedwriting system. No signs; no symbols; no machines; uses ABC's. Easy to learn; easy to write and transcribe. Fast preparation for a job. Surprisingly low cost. 100,000 taught by mail. Used in leading offices and Civil Service. Write for free booklet. **Speedwriting, Dept. 2611-8, 55 W. 42 St., N. Y. 18, N. Y.**

Learn RADIO-TELEVISION In Your Own HOME WORKSHOP

Build interesting Radio Circuits, acquire real experience, do scores of practical experiments — all through RTA's complete balanced training plus 10 BIG KITS of parts which RTA GIVES YOU! Get finest instruction direct from Hollywood, nerve-center of broadcasting, television and radio activities.

FREE BOOK
Send postal for complete details plus **FREE BOOK** "How to Make Good in Radio-Television."

RADIO TRAINING ASSOCIATION OF AMERICA
5620 Hollywood Blvd. Dept. PSK Hollywood 28, Calif.

Electrical Meter Engineering

"The Profession With a Future"

Utilities pay good money to trained Meter Engineers. Increased demands regularly bring new opportunities.

HOME STUDY COURSE

Practical, up-to-date home training covers all types of meters, demand meters, instruments, relays, installation, testing, calibration, repair. Enthusiastic graduates throughout U. S. & abroad.

Low Cost—Easy Terms—Diploma Granted
Write Today for Free Booklet
In Business Since 1909
FORT WAYNE CORRESPONDENCE SCHOOL
Dept. 511 Fort Wayne 2, Indiana



ENORMOUS PROFITS CASTING AT HOME

Write today for **NEW FREE CATALOG**

Learn to cast thousands of perfect figurines, plaques, book ends, ash trays, etc. Start **NOW—NO EXPERIENCE, LITTLE CAPITAL** needed. Earn **GREAT PROFITS** with **X.L. RUBBER MOLDS**. X.L. Rubber, Pts. \$2.00; Qts. \$3.50; Gallons \$8.95; Models and enough rubber for 3 molds . . . \$1.00—Foreign \$1.50.



FREE FACTS SENT

PLASTIC ARTS STUDIO Route 2, Dept. 3 MUNCIE, IND.

Learn BAKING at home

Baking is one of America's high industries in wages. Not seasonable, but year 'round good field for trained and experienced men. Thorough basic spare time home study course lays solid foundation. If you have the aptitude for this type of work, send for **FREE Booklet**, "Opportunities in Commercial Baking."



NATIONAL BAKING SCHOOL
1315 S. Michigan Ave., Dept. 1368, Chicago 5, Ill.



Learn to Write at Home in spare time

You can become a good **Business and Artistic Penman** at home in spare moments by my **Simplified Method**. Write for my **FREE BOOK**, "How to Become an Expert Penman," which contains valuable information and many specimens of penmanship that show what others have learned at home in spare moments. Send 10c for Special Penpoint and your name with a flourished bird written on a card. Write **TODAY**.

A.M. Tevis, Box 25R, Chillicothe, Mo.

For Greater Income

LEARN A TRADE



VETERANS!

C.T.I. courses are approved under the G.I. Bill. Just Mail Coupon, we will handle all details. (Low tuition, easy terms if you are not a veteran.)

FREE BOOKLET

Commercial Trades Institute

Dept. E1-11

1400 W. GREENLEAF
CHICAGO 26, ILL.



- ✓ Auto Mechanics
- ✓ Body-Fender Repair
- ✓ Diesel Engines
- ✓ Television
- ✓ Refrigeration Air Conditioning
- ✓ Electricity Electronics
- ✓ Radio Servicing
- ✓ Drafting
- ✓ Building Construction

The years ahead are going to be big. Grow with them. Prepare now to get into a great, growing industry. Train with C.T.I.—a Nationally Known School. Get the benefits of our efficient Placement Service whether you want a better job or business of your own. You can come directly to our big, well equipped shops, located only a block from the shores of Lake Michigan—or you can begin your training at home by C.T.I.'s **SHOP-PROVED HOME TRAINING METHODS**. Fill out coupon—mail it today for big, illustrated **FREE booklet**.

FILL OUT · CUT OUT · MAIL TODAY!

FACTS FREE FOR MEN WHO WANT TO GET AHEAD

COMMERCIAL TRADES INSTITUTE, Dept. E1-11
1400 W. Greenleaf, Chicago 26, Ill.

Send free illustrated Brochures and other information about the field I have checked below.

- ☐ Body & Fender Repairing
☐ Automotive Mechanics
☐ Diesel Mechanics

- ☐ Radio
☐ Television
☐ Electricity

- ☐ Building
☐ Drafting
☐ Refrigeration and Air Conditioning

Name _____

Address _____

City _____ State _____

☐ Veteran

☐ Non-Veteran



Learn RADIO TELEVISION, ELECTRONICS *by* SHOP METHOD HOME TRAINING

You receive all parts, including tubes, for building this fine, modern Superheterodyne Receiver. This and other valuable standard equipment becomes your property.

Let NATIONAL SCHOOLS, of Los Angeles, a practical Technical Resident Trade School for almost 50 years, train you for today's unlimited opportunities in Radio

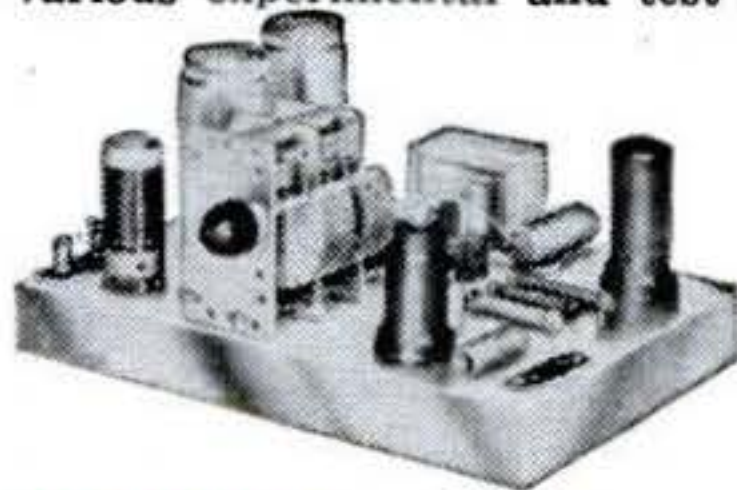
these two **FREE** *books*
will tell you how

GOOD JOBS AWAIT THE TRAINED RADIO TECHNICIAN

You are needed in the great, modern Radio, Television and Electronics industry! Trained Radio technicians are in constant and growing demand at excellent pay—in Broadcasting, Communications, Television, Radar, Research Laboratories, Home Radio Service, etc. National Schools Master Shop Method Home Study Course, with newly added lessons and equipment, can train you in your spare time, right in your own home, for these exciting opportunities. Our method has been proved by the remarkable success of National Schools-trained men all over the world.

You Learn by Building Equipment with Standard Radio Parts We Send You

Your National Schools Course includes not only basic theory, but practical training as well—you learn by doing. We send you complete standard equipment of professional quality for building various experimental and test units. You advance step by step



until you are able to build the modern superheterodyne receiver shown above, which is yours to keep and enjoy. You perform more than 100 experiments—build many types of circuits, signal generator, low power radio transmitter, audio oscillator, and other units. The Free Books shown above tell you more about it—send for them today!

NOW!

NEW PROFESSIONAL MULTITESTER INCLUDED



GET THE DETAILS—SEND THE COUPON

This versatile testing instrument is portable and complete with test leads and batteries. Simple to operate, accurate and dependable. You will be able to quickly locate trouble and adjust the most delicate circuits. You can use the Multitester at home or on service calls. It is designed to measure AC and DC volts, current, resistance and decibels. You will be proud to own and use this valuable professional instrument.

Lessons and Instruction



Material Are Up-to-date, Practical, Interesting

National Schools Master Shop Method Home Training gives you basic and advanced instruction in all phases of Radio, Television and Electronics. Each lesson is made easy to understand by numerous illustrations and diagrams. All instruction material has been developed and tested in our own shops and laboratories, under the supervision of our own engineers and instructors. A free sample lesson is yours upon request—use the coupon below.

YOU GET THIS AND OTHER VALUABLE INFORMATION IN THE FREE SAMPLE LESSON:

1. Basic Receiver Circuits and How They are Used.
2. Construction of the Antenna Circuit.
3. How Energy is Picked Up by the Aerial.
4. How Signal Currents are Converted into Sound.
5. How the Tuning Condenser Operates.
6. How the R-F Transformer Handles the Signal; and other data, with diagrams and illustrations.

Both Resident and
Home Study Courses
Offered

**APPROVED
FOR
VETERANS**

Check Coupon

NATIONAL SCHOOLS

LOS ANGELES 37, CALIFORNIA EST. 1905



MAIL OPPORTUNITY COUPON FOR QUICK ACTION

National Schools, Dept. PS-11
4000 South Figueroa Street
Los Angeles 37, California

(Mail in envelope
or paste on penny
postcard.)

Mail me FREE the books mentioned in your ad including a sample lesson of your course. I understand no salesman will call on me.

NAME.....AGE.....

ADDRESS.....

CITY.....ZONE.....STATE.....

☐ Check here if veteran of World War II

SANDEE *Specials*

SANDEE MUFFLERS
V-8
DUALS
& SINGLES



MUFFLERS Steels & Aluminums with a MELLOW Motorboat Tone

SINGLES, Chev., V-8, Plymouth, Steels \$5.50 Aluminum \$7.00 Chry., Olds Buicks etc, Steels \$7.50, Aluminum \$9.00 V-8 and MERCURY DUALS, Steel \$17.50 Aluminum \$21.00. Split Manifold Sets, Steels \$35.00, Aluminum \$45.00 '49 Ford Duals, \$2.50 extra

SANDEE ALUMINUMS ARE GUARANTEED FOR LIFE OF YOUR CAR

Streamline Your Car with SANDEE FENDER SKIRTS...\$17.20 pr.

Sparkling beauty you'll like. Constructed of heavy gauge body steel, finished in prime perfect fit



For Ford Chev (except Fleetline), Merc, Plym. De Soto Chrys, Dodge, Kaiser, Frazer, Buick (except 42-48 Super), Olds Series 60 & 70 1937 40 Pont 6 1939-40

Beautify your car bring out the flowing lines inherently designed there

for **AMAZING** acceleration

DIXIE-WESTERN DUAL INTAKE MANIFOLDS for V-8 FORDS AND MERCURYS \$15.00

Gas Line and Throttle Kit \$2.50 extra
Chrome Plated Velocity Stacks \$3.00 pair

By test: Increased acceleration by 26%—increased power and speed by 11%

All DIXIE WESTERN manifolds are brightly polished cast aluminum

ATTENTION service station men, garage men, and auto parts store owners: we have a profitable dealer's discount on quantity orders of any of the above merchandise

SANDEE MUFFLER COMPANY
Box 296 La Tijera Station
Los Angeles 43 California

WE SHIP C.O.D

Please ship— Mufflers Dual Set ☐ Single, ☐
Fender Skirts ☐ Dixie Western Manifolds ☐

Make of Car _____ Model _____ Year _____

Name _____

Address _____

City _____ State _____

Check Enclosed \$ _____ Ship C.O.D \$ _____

SANDEE MUFFLER CO.

Factory Address

5643 Corryne Place Culver City, California

LAW

STUDY AT HOME for Business Success and LARGER PERSONAL EARNINGS. 39 years expert instruction—over 114,000 students enrolled. LL.B. Degree awarded. All text material furnished. Easy payment plan. Send for FREE BOOK NOW—"Law and Executive Guidance."

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 95-PS, 646 N. Michigan Ave., Chicago 11, Ill.



PATENTS

AND TRADE MARKS

C.A. SNOW & CO.

REGISTERED PATENT ATTORNEYS

WRITE FOR INFORMATION TO
246 SNOW BUILDING, WASHINGTON 1, D. C.



INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH

Registered Patent Attorney

205 Columbian Building Washington 1, D. C.

Thrilling Work COLORING PHOTOS at Home

Fascinating hobby and vocation learned at home by average man or woman who is artistically inclined. Work full or spare time. Modern method brings out natural, life-like colors. Many have earned while learning. FREE BOOKLET tells how to get started doing this delightful home work for photographers, stores, individuals, and friends. Send today for your copy. No obligation.

NATIONAL PHOTO COLORING SCHOOL
1315 S. Michigan Ave., Dept. 1368, Chicago 5, Ill.



HELP FOR INVENTORS

Hundreds of manufacturers have requested our assistance in locating marketable new products.

Complete information, free.

INSTITUTE of AMERICAN INVENTORS

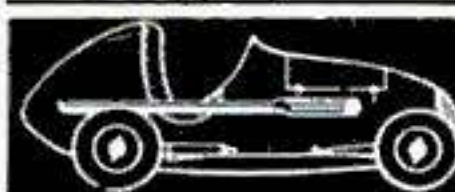
Dept. 3, 1926 Eye St. N.W., Washington 6, D. C.

ENGINEERING DEGREE IN 27 MONTHS

INDIANA TECHNICAL COLLEGE

Aeronautical, Chemical, Civil, Electrical, Mechanical, and Radio Engineering (Inc. television). Drafting, 1-yr. Gov't approved for G.I.'s. Low rate. Earn board. Large industrial center. Students from 48 states, 18 countries. Demand for graduates. Enter Dec., March, June, September. Catalog.

6118 E. Washington Blvd., Ft. Wayne 2, Ind.



World Headquarters for

HOT ROD and RACING Equipment





Dual Coil Ford V8 Ignition

For Racing or High-way. RPM over 8000 guaranteed. Faster Acceleration. More Top Speed—Better Gas Mileage. Triples Ignition life. \$29.50 exchange.

Hydraulic Brake Conversion Units FORD A-B and through '38

Install Hydraulic Brake system now—Be SAFE. Complete kit includes everything needed—Cylinders, backer plates, lines, spacers, brackets, hoses, fittings, easy-to-follow instruction and etc. Easy to install in 3-4 hours. Money back guarantee.

ORDER DIRECT AND SAVE!

Complete kits only \$65.00 F.O.B. Los Angeles. Check, Money Order, etc. 25% deposit on C.O.D.

Streamline, Modernize Your Ford V8

Lower body with our special shackles. Gives car Fast, Low, Racing look—Smoother Ride. Easily installed—no welding or cutting. Set of 4 \$1.50 (Specify 4" or 6" shackles and year of car).

FREE—HISTORY & CATALOG with order.

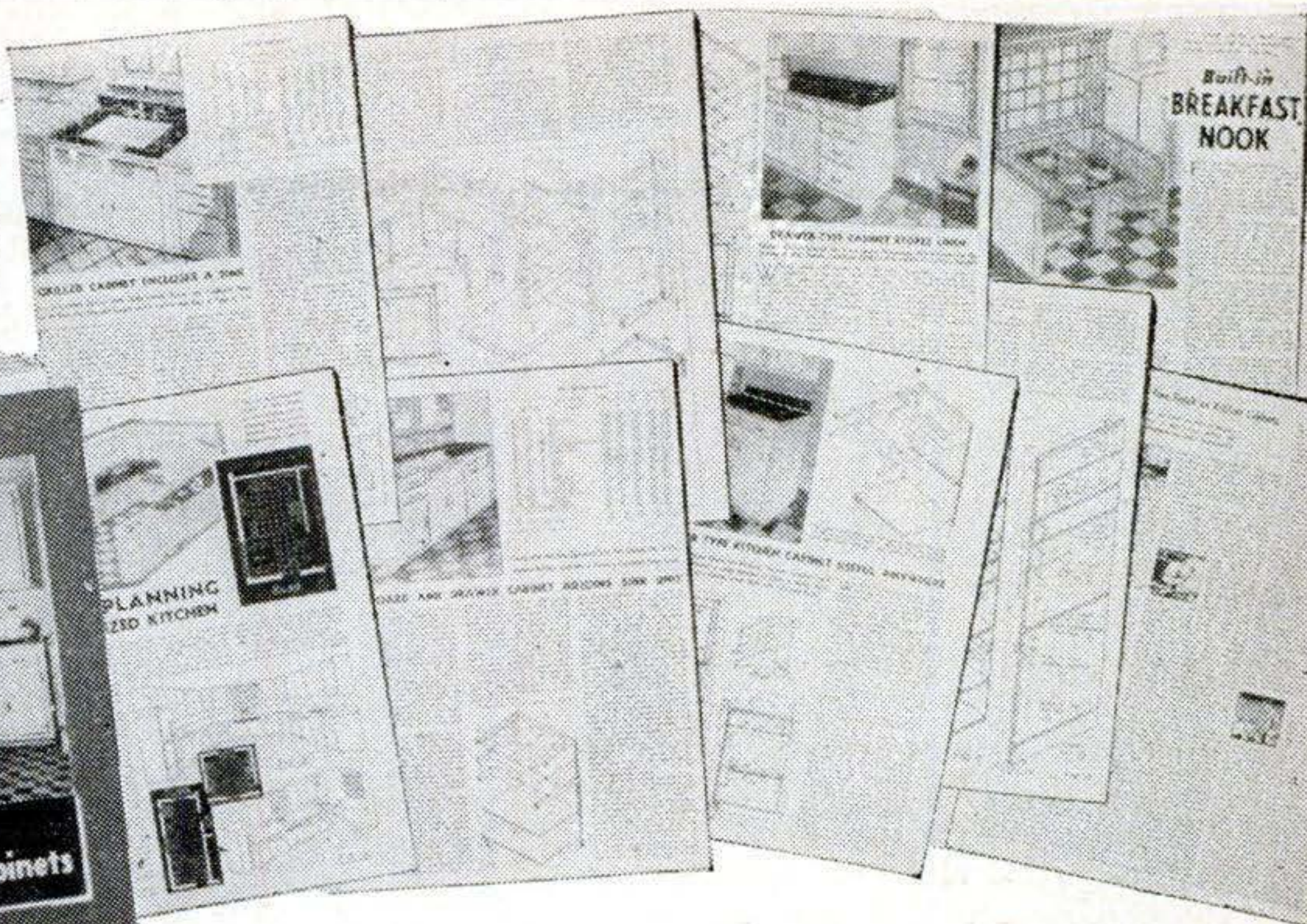
We supply everything you need to build your own Track Cars—Hot Rods and Boats—the ideas, technical data and equipment. Start Today—Order Speed STACKS and Streamline SHACKLES. RACING HISTORY and CATALOG 25c without order.



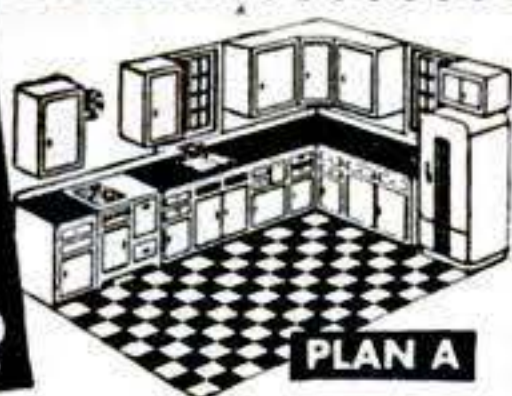
HISTORY of HOT ROD and MIDGET RACING and CATALOG 25c

ANSEN AUTOMOTIVE ENGINEERING CORPORATION
3801 W. Jefferson LOS ANGELES CALIF.

free!
7-Day Trial
Just Mail Coupon NOW



Which of these
**MODERN
KITCHENS**
do YOU want?



TYPICAL kitchen schemes shown here are but a few of many, many combinations you can have by selecting cabinets for your own special needs and in widths that fit your available space



PLAN A is a suggested arrangement if you have two adjacent walls for cabinets. PLAN B gets a wide variety of cabinets into compact space along one wall. PLAN C has broom closet



PLAN D has cabinets along one wall and utilizes corner for convenient dinette. PLAN E is laid out on the efficient U principle around three walls. Built-in breakfast nook included

How to Bring Your Kitchen Up-to-Date-

How to Plan the Space—Build the Cabinets Install and Finish Like a Professional

"How to Build Modern Kitchen Cabinets" makes your dream kitchen come true. Only book of its kind. Amazing! Helps you select best cabinets for special needs. Guides you every step. Then shows how to install, finish for a perfect job!

Best of all, it is yours on free trial if you act at once. Just fill in and mail coupon.

Save Money Building Your Own!

Shows you how to build one cabinet, at a time, or combination. A style for every purpose, a size for every kitchen.

When you're ready, simply measure space, refer to "Modern Kitchen Cabinets" complete lumber list of sizes. Easy as that! Simplified so that you find all the help you need. Units designed to be assembled in workshop and brought to kitchen ready to install.

Secrets of Planning Revealed

Should cabinets be near door? Sink? Work counters? Where should dishes be kept? Answers are in your copy of "Modern Kitchen Cabinets." An architect works with the same facts you find here. Read chapter on "Secret of Planning a Modernized Kitchen"

and you'll learn fundamentals. Then select the RIGHT CABINETS and locate them to save steps. You'll pick the best combination to fit your space. Be sure of work-counters where needed!

To save time and error, the designer has prepared a cutting list in chart form. There's a chart for each cabinet, complete for whatever size you choose. This alone cuts work in HALF. All you do is cut single pieces of wood to sizes given. When all are ready, assemble into a finished cabinet!

Gives You the Answer to Every Problem

Every step, every operation fully described. Every detail clearly shown. How to cut joints, what size to cut every piece in every style. Nothing missing! Plywood or solid wood; plastic or metal moulding. Reveals types, how to install hardware. How to hang cabinet. How to cement linoleum to tops. How to insert grilles. How to ventilate. Special drawer-runner construction. Beautiful, lifetime hard-cover binding.

Mail Free Examination Coupon Now

Will be sent for 7 days' free trial. Now you can build the kitchen cabinets you need. You can plan your own kitchen. Why delay? Why be old-fashioned? Get started now.

SEND NO MONEY JUST MAIL COUPON

Pay postman only \$1.50 plus postage, or send \$1.50 (check or money order) and WE pay postage. Read and study it for 7 days at our risk. If not delighted—if not worth every penny of \$1.50 to you, send it back at our expense. We will refund your \$1.50 by AIR MAIL.

"HOW TO BUILD MODERN KITCHEN CABINETS" was compiled by the Editors of CRAFTSMAN PUBLISHING.

CRAFTSMAN PUBLISHING
115 Worth Street, Dept. PS11
New York 13, N. Y.

What Enthusiastic Readers Say:

"I have made quite a few from plans. I received 15 more orders."

—M. F., New Jersey
"I am in the midst of making a complete set using the plans which I find excellent. You have set them forth in such complete detail — greatly appreciated."—W. J. R., Absecon, N. J.

CRAFTSMAN PUBLISHING, Dept. PS11
115 Worth St. New York 13, N. Y.

Send me "How to Build Modern Kitchen Cabinets" on 7 days' Free Trial. If I am not delighted, you will refund my \$1.50 at once.

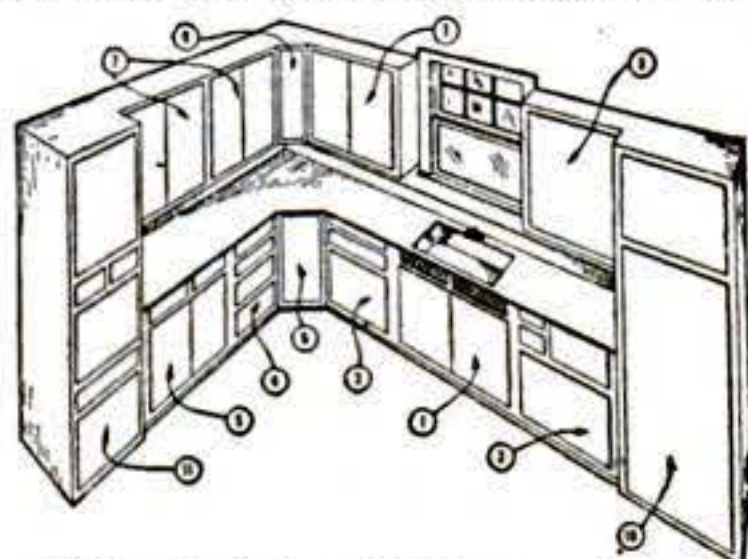
Name _____

Address _____

City _____ Zone _____ State _____

☐ I enclose \$1.50. Send postpaid.

☐ Send C.O.D. I will pay postman \$1.50 plus postage.



Wide Variety of Floor and Wall Models

- 1—Sink. 2—Drawer and cupboard.
- 3—Single door. 4—All drawer.
- 5—Double door. 6 & 9—Corner.
- 7—Double door wall unit. 8—Single-door wall. 10—Broom closet or storage. 11—Desk and storage.

EVERY STYLE CABINET!

Flex-O-Shaft

HANDLES LIKE
A PEN*

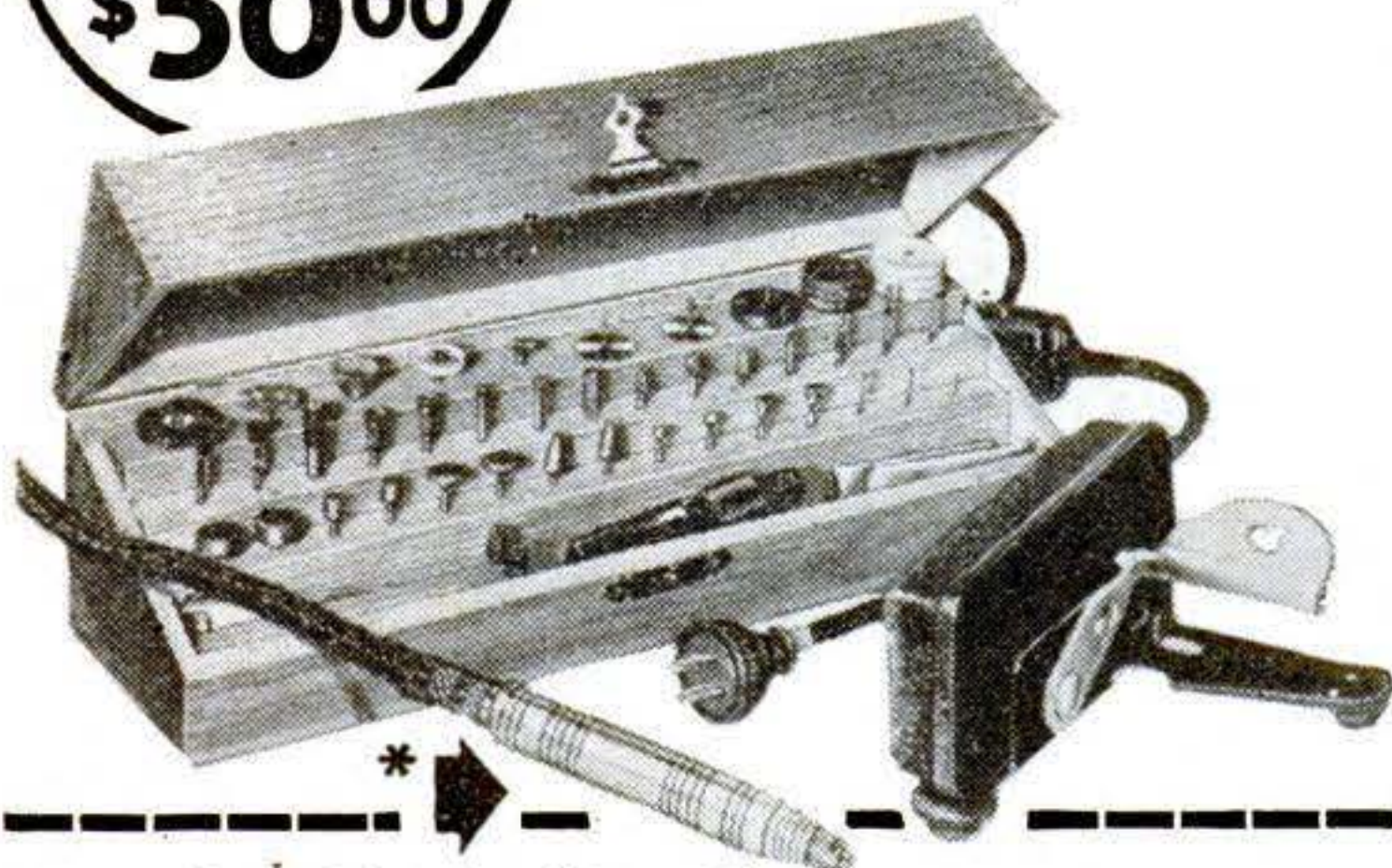
\$35⁰⁰



FLEX-O-SHAFT is an improved all-purpose machine for homes, schools, shops, or factories. The slender, light-weight aluminum hand piece is ideal for grinding, drilling, sawing, buffing, scoring, etching, polishing, and scores of other uses. There is no bulky, throbbing, pulling motor in your hand. The light-weight motor can hang on the wall, or can be set down on working table. Speed is controlled by foot-operated rheostat, leaving hands free. This precision ball-bearing tool is as easily guided as a pen, speeding up operation because of ease in handling. It is a wonderful, compact, power house for making all kinds of objects. This unit consisting of Flex-O-Shaft with 6-ft. cord, 1/16 H. P. Motor, Rheostat with cord and plug, all for \$35.00. Send for complete information today! Use coupon below.

FLEX-O-SHAFT
and complete
tool Kit with
66 accessories
ONLY

\$50⁰⁰



Flex-O-Shaft Sales Co. (Dept. D)
Prairieview, Illinois

- ☐ Please send complete information on the Flex-O-Shaft Kit.
☐ Please send one Flex-O-Shaft Kit. \$50.00 enclosed. Shipping charges C.O.D.

Name.....
Address.....
City.....Zone.....State.....



100% PROTECTION

TEAR GAS

A REAL SURE-FIRE SELLER!

THUGS AND THIEVES BEWARE!

Here is a tear gas pencil gun which discharges smothering clouds of tear gas to instantly stop, stun and incapacitate the most vicious man or beast. A safe and effective substitute for dangerous firearms. No permanent injury. Needed in Stores, Banks, Autos and Homes, everywhere to protect Life and Property. **No skill required.** Handle our tear gas as a side line and you'll soon give it full time. For a quick start send \$3.60 for complete demonstrator outfit consisting of an Automatic Pencil Gun with 10 demonstrators and 3 powerful Tear Gas cartridges fully guaranteed. Many thousands now in use. Order your outfit today.

Hagen Supply Corp.

Dept. D-511

St. Paul 4, Minn.

**WOULD YOU LIKE TO MAKE
... \$100 a week ...**

in your own

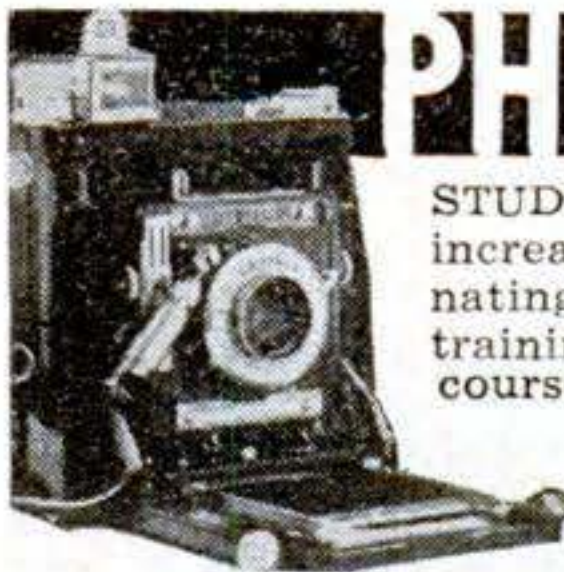
ELECTROPLATING BUSINESS
FULL OR SPARE TIME

Write NOW for **FREE** illustrated booklet that will
start you on the road to financial independence!

JOSEPH B. KUSHNER

Metal Finishing Engineer

Stroudsburg 11, Penna.



PHOTOGRAPHY

STUDY AT HOME. Photography offers ever-increasing opportunities for well-paid, fascinating careers. Success-proved N. Y. I. training qualifies you at home. Also resident courses. 39th year. Details **FREE!**

**NEW YORK INSTITUTE
OF PHOTOGRAPHY**

Dept. "5," 10 West 33 St., New York 1, N. Y.



MECHANICAL DENTISTRY

To make Crowns, Plates, Bridgework, etc., for Dentists. Easy practical way to learn mechanical dentistry at home in spare time. **FULL EQUIPMENT OF TOOLS AND MATERIALS INCLUDED WITH COURSE.** Low tuition. Easy terms. Write for **FREE**

BOOK about this money making profession that is not affected by the machine age.

McCARRIE SCHOOL of Mechanical Dentistry
207 N. Broad St. Dept. 880 Philadelphia, Pa.

**LEARN IN SPARE TIME—
by Easy PICTURE
CARTOONING CHART
METHOD!**

Same Simplified Method that has helped train creators of "Steve Canyon," "Winnie Winkle," "Out Our Way," "Secret Agent X-9," "The Neighbors," "Reg'lar Fellers," "Strange As it Seems," and many others. Send 10c for Picture Chart (to test your ability), and full details. (State age.)

LONDON SCHOOL OF CARTOONING
4831 Cleve. Transit Bldg., Cleveland 14, Ohio



Say You Saw It In Popular Science



POCKET OR PURSE RADIO!
SIZE

SMALL AS A PACKAGE OF CIGARETTES Wt. only 4 oz.—**BEAUTIFULLY** molded silver black case. **NO TUBES—BATTERIES OR ELECTRIC "PLUG-INS" NEEDED!** Uses **NEW Type** fixed power crystal diode. **ONE YEAR SERVICE GUARANTEE.**

GUARANTEED TO WORK on local stations if used as directed. Listen at home, in cabins, in bed, on farms, hotels, offices—most anywhere. L. S. of Texas says "It's Wonderful".

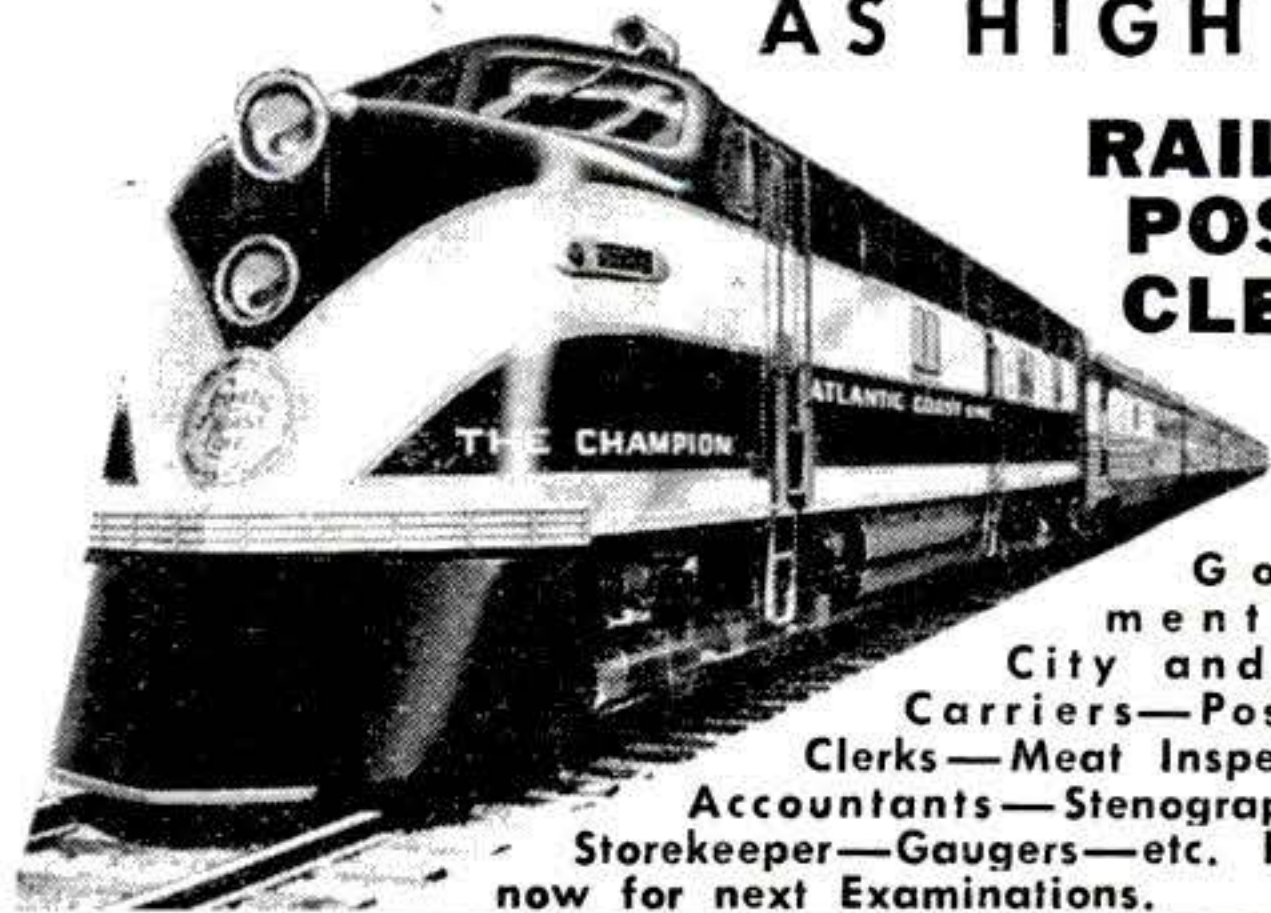
SEND ONLY \$1.00 (bill, money order, check) and pay postman \$2.99 plus C.O.D. fees on arrival or send **ONLY \$3.99** for postpaid delivery. **Complete—Ready**

to play on simple attachment! Marvelous gift for children or grownups; Bargain priced! Order your Pakette Radio now! Be the first in your town! (Foreign \$5.00 U. S. Cash).

MIDWAY SALES COMPANY, INC., Dept. TPS-11, Kearney, Nebr.

TRAVEL FOR "UNCLE SAM"!

AS HIGH AS \$3,351 FIRST YEAR



RAILWAY POSTAL CLERKS

Many Government Jobs.
City and Rural Carriers—Postoffice Clerks—Meat Inspectors—Accountants—Stenographers—Storekeeper—Gaugers—etc. Prepare now for next Examinations.

Veterans Get Special Preference

FRANKLIN INSTITUTE,
Dept. H81, Rochester 4, N. Y.
(Not Government Controlled)

Sirs: Rush to me, without charge, copy of 40-page book, "How to Get a U. S. Government Job," list of positions, and full particulars telling how to qualify for them.

NAME.....

ADDRESS.....VET?.....

SEND FOR FREE CATALOG

WAR SURPLUS VALUES

MONEY BACK GUARANTEE

SHEEPLINED JACKET



Air Corps Type B-3. Like new. All leather with full sheep lining and large sheepskin collar. Zipper front, adjustable waist tabs. Sizes 40, 42.

PLUS 35¢ FOR MAILING

18.95



PARKA COAT

New Army Air Force Type B-11. Finger tip length. Fully lined with mouton fur. Zipper front and button front. Sizes 36 thru 46.

PLUS 35¢ FOR MAILING

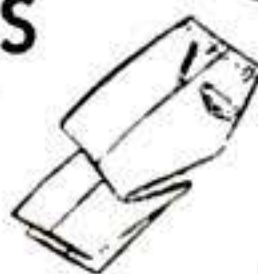
24.95

OFFICERS' PINKS

Brand new. Fine quality officers' elastic trousers. Sizes 28 thru 32. Reg. \$17.95 value.

PLUS 35¢ FOR MAILING

11.50



SEND CASH WITH ORDER OR SAY C. O. D.

SHEEPLINED FLIGHT PANTS



Reissue, excellent condition. All leather. Sizes small, med., large.

PLUS 35¢ FOR MAILING

4.98

CUSHION SOLE SOX

Army reject. O.D. color. 63% wool.

PLUS 15¢ FOR MAILING

6 pr. 3.50



AVIATORS' JACKET

Brand new. Air Corps Type B-15. Alpaca lined. Mouton fur collar, zipper front. Sizes 36 thru 46.

PLUS 35¢ FOR MAILING

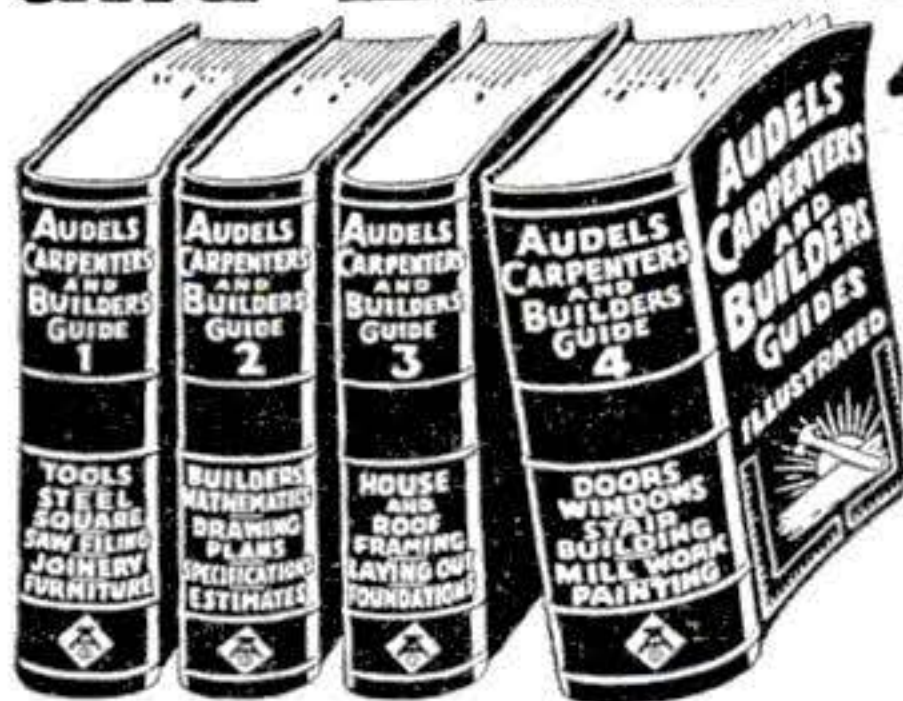
9.88



NATIONAL JOBBING CO.

1703 No. 24th St. Dept. S-11 Omaha, Nebr.

AUDELS Carpenters and Builders Guides 4 vols. \$6



Inside Trade Information
for Carpenters, Builders, Joiners, Building Mechanics and all Woodworkers. These Guides give you the short-cut instructions that you want—including new methods, ideas, solutions, plans, systems and money saving suggestions. An easy progressive course for the apprentice and student. A practical daily helper and Quick Reference for the master worker. Carpenters everywhere are using these Guides as a Helping Hand to Easier Work, Better Work and Better Pay. To get this assistance for yourself, simply fill in and mail FREE COUPON below.



Inside Trade Information On:

How to use the steel square—How to file and set saws—How to build furniture—How to use a mitre box—How to use the chalk line—How to use rules and scales—How to make joints—Carpenters arithmetic—Solving mensuration problems—Estimating strength of timbers—How to set girders and sills—How to frame houses and roofs—How to estimate costs—How to build houses, barns, garages, bungalows, etc.—How to read and draw plans—Drawing up specifications—How to excavate—How to use settings 12, 13 and 17 on the steel square—How to build hoists and scaffolds—skylights—How to build stairs—How to put on interior trim—How to hang doors—How to lath—lay floors—How to paint.

AUDELS, Publishers, 49 W. 23rd St., New York 10, N. Y.
Mail Audels Carpenters and Builders Guides, 4 vols., on 7 days' free trial. If OK I will remit \$1 in 7 days and \$1 monthly until \$6 is paid. —Otherwise I will return them. No obligation unless I am satisfied.

Name.....

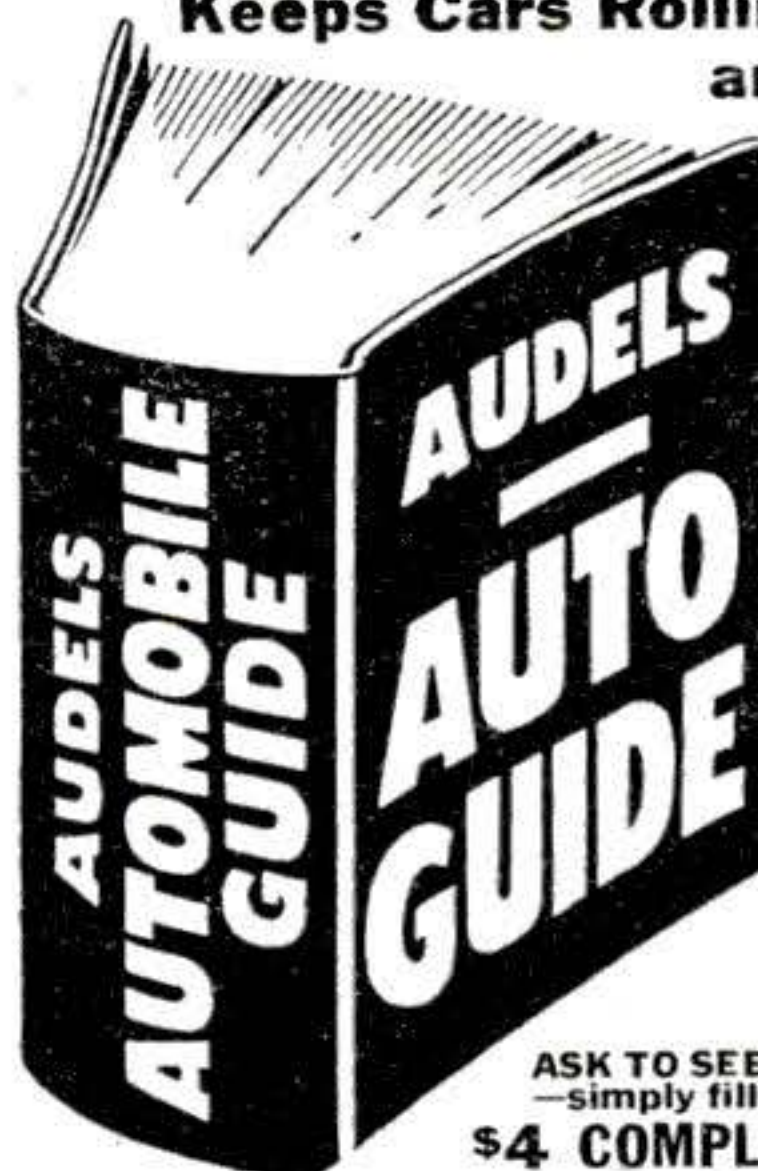
Address.....

Occupation.....

Employed by.....

PRACTICAL AUTO INFORMATION

Keeps Cars Rolling by Making Repairs and Adjustments Easy!



AUDELS AUTO GUIDE
For Every Mechanic, Driver, Owner and Repair Shop.

Sent on 7 Days Approval
Shows How to Tune Up—Keep Brakes Safe—Batteries Powerful—Tire Mileage Up—Save Gas—Lubricate Correctly.

ANSWERS YOUR QUESTIONS
Contains all you need to know about 1—Construction, 2—Operation, 3—Service, 4—Repair of Modern Motor Cars, Trucks, Buses & Diesel Engines in every detail.

NEW FLUID DRIVE TREATED
Easy to understand—1540 Pages, 1540 Illustrations. Gives definite directions on How to handle service jobs.

ASK TO SEE IT—Get this information for yourself—simply fill in and mail coupon today.

\$4 COMPLETE • PAY ONLY \$1 A MO.

AUDELS, Publishers, 49 West 23rd St., New York
Mail AUDELS AUTOMOBILE GUIDE \$4 for free examination. If O. K., I will send you \$1 in 7 days; then remit \$1 monthly until \$4 is paid. Otherwise, I will return book promptly.

Name.....

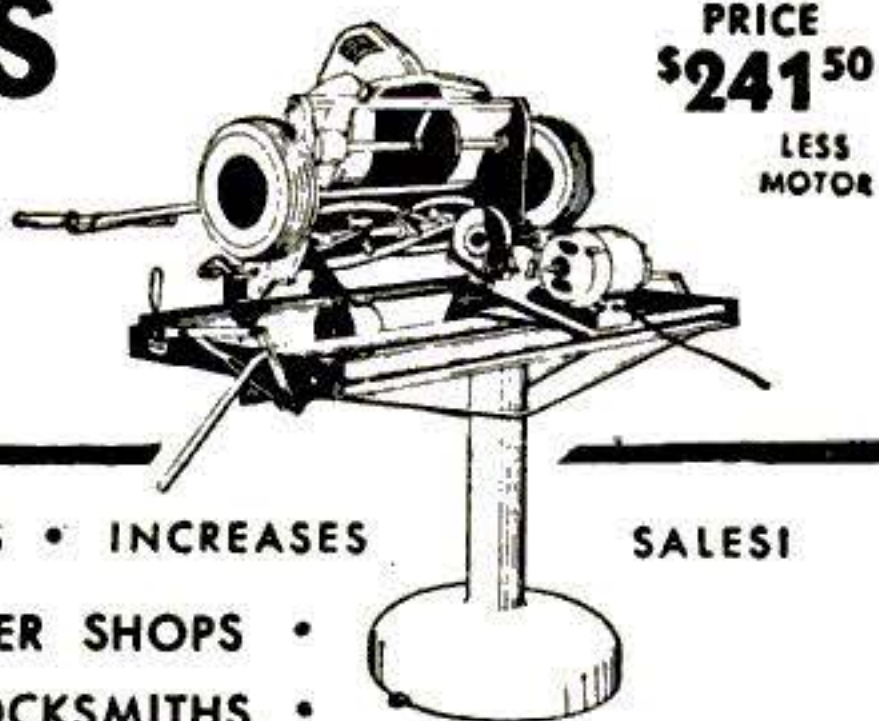
Address.....

Occupation.....

Employed By.....

MODERN LAWN MOWER SHARPENER

PROFITS and SPEED



PRICE
\$241.50
LESS
MOTOR

INCREASES PROFITS • INCREASES SALES!
FOR LAWN MOWER SHOPS •
FIXIT SHOPS • LOCKSMITHS •
HARDWARE STORES • GOLF COURSES • SCHOOLS
PARKS • PLAYGROUNDS • INSTITUTIONS •
CEMETERIES • AND ALERT INDIVIDUALS!

*Sharpens All Reel Type Mowers • Hand, Power or
Gang • 10 to 20 Minutes • No Dismantling
No Extra Attachments Needed*

All reel type mowers, from 5-inch edgers to 36-inch power mowers, are quickly sharpened to extreme ends of both left and right twist reel blades. Handle, wheels, roller and motor remain in place when sharpening is in process. Bed knife is sharpened in same brackets that hold mower in grinding position. No extra attachments required. One lever puts mower or bed knife in grinding position. 100% steel construction. Grinding head rides on five ball bearing races. Small, compact, easy to operate. Sharpens wood chisels, joiner knives and planer blades without extra attachments.

ORDER NOW
Immediate Delivery

*Skate Sharpener Attachment Available
1/3 H.P., 60-Cycle G.E. Motors Now Available \$21.50
Send For Free Bulletin No. 11B*

MODERN MFG. CO. 160 N. FAIR OAKS AVE
PASADENA, CALIFORNIA

LEARN WATCH REPAIRING AT HOME WITH OUR NEW SELF-TRAINING KIT



Get started NOW in this uncrowded field! EASY to learn! BIG MONEY! SECURE FUTURE! Earn while you learn! Even as a sideline you can make \$50 and up each week!—Our new PRACTICAL SELF-TRAINING KIT is all you need. Contains set of PROFESSIONAL TOOLS: (Loupe, 3-4 power; complete set of 6 special screw drivers—finest tempered steel blades; Tweezer AA; Plastic Material tray) and COMPLETE BOOK on Modern Watch Repairing. Fully illustrated, easy to understand, shows every step in repair, adjustment and use of tools. Now only **\$6.25** Post Paid (If C.O.D., plus charges.) Money Back Guarantee. If ordered separately; book \$3.25; set of tools, \$3.50.

MODERN TECHNICAL BOOK & TOOL CO.
Dept. MPS, 55 W. 42nd Street, New York 18, N. Y.

JUST OUT! New All-Inclusive Tool, Material Catalog Revised and Enlarged for Watch-Clockmakers, Jewelers, Tool-Instrument makers, Handicrafters. Over 600 ILLUSTRATIONS and IDENTIFICATION CHART. NEW REDUCED PRICES. All books in these fields; write for literature. SEND 25c for catalog—FREE with order.

LEARN CHEMISTRY AT HOME

The demand for men trained in chemistry is great. Big pay job opportunities are growing by leaps and bounds. If you want to get into this fast growing, fascinating, high pay field by studying chemistry at home, write today.
INSTITUTE OF PRACTICAL CHEMISTRY
45 PROSPECT AVENUE, HAGERSTOWN, MD.



PILOTS' JACKETS

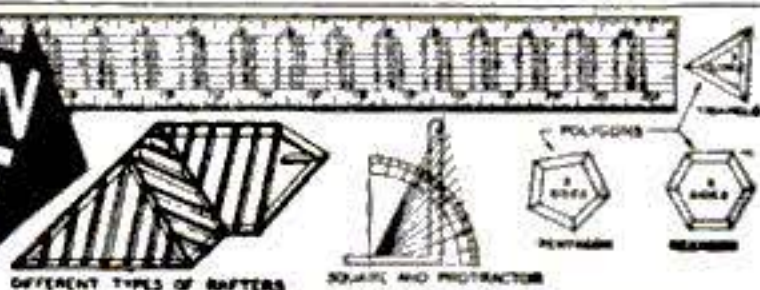
(Right) B-15 STYLE BOMBER JACKET. Sturdy water repellent mountain cloth. Warm fleecy all-wool lining. Genuine Mouton Fur (Beaver-dyed Lamb) collar and chin strap. 34-46, \$12.95
REGULATION B-15 JACKET. Made same as for AAF. Heavy alpaca wool lining throughout. 34-46, \$16.95
CAP (illustrated). O.D. wool outside, alpaca pile flaps, \$1.25
B-3 SHEEPSKIN LEATHER JACKET (Left). Water repellent acrylate finish. Full shearling fleece inside. Sizes 34-36-38 \$15.95; Sizes 40-46, \$18.95; B-2 Shearling Lined Leather Cap \$2.50; Sheepskin Leather Pants \$7.50



Write for FREE illus. list clothing. Orders sent postpaid except C.O.D. Satisfaction or money back.
CONSUMERS CLOTHING CO., Inc., Box 5, 20 Greene St., New York 13, N.Y.

ANYONE CAN DO THIS IF

THEY HAVE OUR CHART



SPECIAL OFFER FOR AGENTS

Blue print 27 x 36" now printed on both sides showing squares full size. Shows how to find the length of any rafter, find any angle, in degrees, frame any polygon three to sixteen sides, read the board foot and brace-table, octagon scale, rafter tables, many other uses, can be scaled down for model work as well as full scale framing. Also chart changing pitches to degrees. For use with radial saws. About 13 square feet of printed copy sent post paid for \$1.00. No checks or stamps. **MASON ENGINEERING SERVICE**, 2032 N. Burdick St., Dept. 11, Kalamazoo 81, Mich.

Say You Saw It In Popular Science

IT'S FOOLISH TO PAY MORE! DANGEROUS TO PAY LESS.

Send This Ad



98% Nonskid 14 MO. GUARANTEE

HIGH TREADS, WORN SLIGHTLY OK'd 'A1' by ADJ. NOT RECAPS	600-16	\$4.60	600-20	\$8.00
	650-15	4.40	650-20	8.00
	650-16	4.60	700-20	10.00
	550-17	5.75	32x6(8)	9.25
	700-16	5.20	32x6(10)	11.00
	700-15	4.75	825-20	12.25
	750-16	5.50	900-20	13.00
	Triple AAA near-new top grade			
	24 Months Guarantee			
	600-16	\$6	600-20	\$10
650-15	6	700-20	11	
650-16	6	32x6(8)	11	
550-17	7	32x6(10)	12	
700-16	7	825-20	13	
700-15	7	900-20	14	
750-16	8	1000-20	15	
All other Sizes, too				
Military Tread Tires				
750-20	Standard (18 mos)	\$11		
750-20	Super (30 mos)	\$13		
Fit 32-6	700-20	650-20		

BLATT TIRE SERVICE
Dept. G, 4834 Lancaster Ave.
Blatt Bldg., Phila., Pa.

THIMBLE DROME RACER



Car Only
\$4.25
Postpaid

Completely
Finished

SPEED! ACTION! Now easily adapted for miniature gas engine or other power.

panel and numbers. Equipped with bridle lugs for cable track racing. Car is 9 3/8" long, 4" high. Weighs 18 oz.

THIMBLE DROME RACER, Car Only, Without Transmission and Engine, postpaid.....\$4.25
THIMBLE DROME RACER, With Geared Transmission and Pinion Gear for Arden Engine INSTALLED. (Less Engine) Postpaid.....\$10.35

ARDEN ENGINE—.099. For Thimble Drome Operation, Postpaid.....\$12.75

ARDEN GLO-PLUGS. For Ignitionless operation. Postpaid.....\$.85

Order today—you can't beat this for fun! Include remittance with order. If COD send \$1.00 deposit on car, \$2.00 deposit on transmission and engine. Rush order for immediate delivery.

HOME-SHOP PRODUCTS CO.

DEPT. 28, 4821 SHERIDAN ROAD, CHICAGO 40

STUDY AT HOME

With An Educational Institution

Men with specialized training win higher positions, insure larger earnings, and are bigger successes in business and public life. Opportunities NOW greater than ever before. Send for our Catalog.

ARTS and SCIENCES

Courses in Philosophy; Education; Letters; Public Health; Medical Jurisprudence; Psychology; Sociology; Physics; Chemistry; Plastics; Geology; Political Science; Theology; Business and Commerce; Accounting; Mathematics; Statistics; Agriculture.

ENGINEERING

Courses in Electrical, Civil, Mechanical, Drafting, Architectural, Steam, Aeronautical, Radio, Structural, Mining, Industrial, Petroleum, Marine, Chemical, Diesel, Automobile, Refrigeration, and Air Conditioning Engineering

LAW

Complete Professional Law Course includes 18 Hornbrook Series college grade textbooks. Courses also in Commercial Law, Patent Law and Medical Jurisprudence. McKinley-Roosevelt Incorporated, 4610-AB, Sheridan Rd., Chicago 40, Ill.

Ball-Bearing SPEED WHEELS

NEW
PRICES



Dealers, Jobbers, and Manufacturers! Our new prices will interest you.

Juvenile Wheels
(No bearing, solid tires)

4" 45c 6" 65c
7" 75c

(Semi-pneumatic tire, ball bearing)

6 x 1.....1.65 8 x 2.....2.20
8 x 1.25.....1.85 10 x 1.25.....2.20
8 x 1.75.....1.95 10 x 1.75.....2.30
12 x 1.75.....3.45

Industrial Wheels for Heavy Loads

6 x 2 Welded....3.45 10 x 2.75 HC....5.70
6 x 2 Bolted....4.35 10 x 2.75 Pne....7.60
8 x 1.....5.25 12 x 2.00.....6.90
8 x 2.00.....5.20 12 x 3.00.....10.60
8 x 2.50.....5.40 4.00 x 8-2.....14.70
10 x 2.00.....6.10 4.00 x 8-4.....15.85
16 x 4.00.....15.15

WRITE US NOW FOR COMPLETE NEW CATALOG
Send check with order. No C.O.D.

JIM BROWN TOY COMPANY

1093 Home Ave.

Akron 10, Ohio

Model Racing SENSATION

With or Without New
Gear Drive Trans-
mission

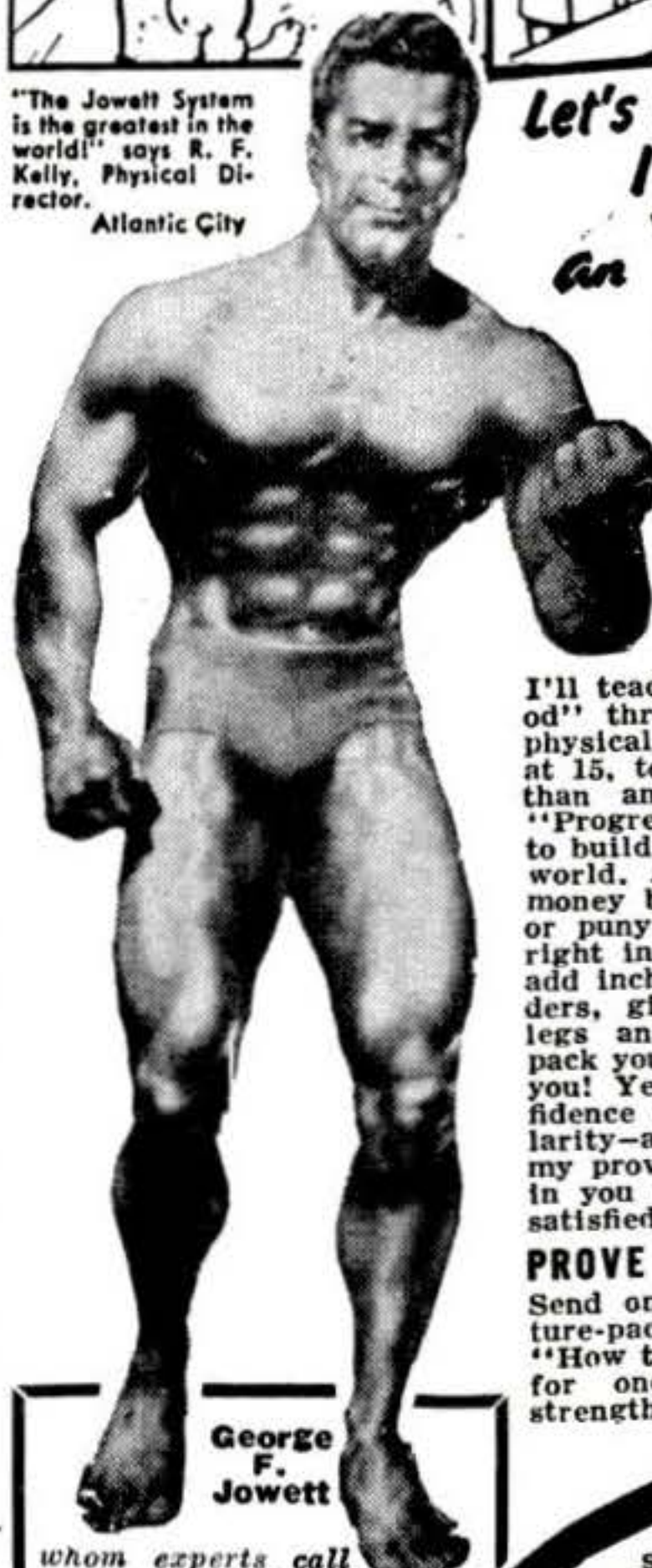
JOIN IN THE
MODEL RACING FUN

New, accurate scale model of midget racer, the classiest thing you ever laid eyes on. Die cast malleable aluminum body, turned aluminum rubber-tired wheels, Chrome exhaust stacks, Wobble pump. Simulated leather seat and back. Instrument

BE A WINNER AT ANYTHING YOU TACKLE WITH **PROGRESSIVE POWER**



"The Jowett System is the greatest in the world!" says R. F. Kelly, Physical Director.
Atlantic City



George F. Jowett

whom experts call "Champion of Champions"
• World's wrestling and weight lifting champ at 17 and 19 • World's Strongest Arms • 4 times World's Perfect Body—plus other records!

10 DAY TRIAL!
Think of it—all five of these famous courses now in one picture-packed muscle-building volume for only 25c. If you don't actually FEEL results within ONE WEEK, send it back and your money will be promptly refunded!

PHOTO BOOK OF FAMOUS STRONG MEN!

FREE!



Photos that inspire you to might and muscle. Free with order.

George F. Jowett
Champion of Champions

NAME.....AGE.....
(Please Print Plainly, Include Zone Number)

ADDRESS.....

Now **ALL 5 FAMOUS JOWETT COURSES** in 1 Volume For only **25c**

Let's Go, Pal! I'll prove I can make YOU an **"ALL-AROUND" HE-MAN**

FAST—or NO COST!
says George F. Jowett
World's Greatest Body Builder

Enjoy My "Progressive Power" Strength Secrets! Give Me 10 Easy Minutes a Day—Without Strain!

I'll teach you the "Progressive Power Method" through which I rebuilt myself from a physical wreck the doctors condemned to die at 15, to the holder of more strength records than any other living athlete or teacher! "Progressive Power" has proven its ability to build the strongest, handsomest men in the world. And I stand ready to show you on a money back basis—that no matter how flabby or puny you are I can do the same for you right in your own home. Let me prove I can add inches to your arms, broaden your shoulders, give you a man-sized chest, powerful legs and a Rock-like back—in fact, power pack your whole body so quickly it will amaze you! Yes, I'll jam you with power and confidence to master any situation—to win popularity—and to get ahead on the job! Through my proven secrets I bring to life new power in you inside and out, until YOU are fully satisfied you are the man you want to be.

PROVE IT TO YOURSELF IN ONE NIGHT
Send only 25c for my 5 easy-to-follow, picture-packed courses now in 1 complete volume "How to Become a Muscular He-Man." Try it for one night! Experience the thrilling strength that surges through your muscles.

I am making a drive for thousands of new friends fast—REGARDLESS OF COST!

SO GET NOW MY 5 Muscle Building COURSES
(Valued at \$5 each)

All in 1 Great Complete Volume Packed With How-To-Do-It Pictures!
Now, this "get-acquainted," extremely low price of only 25c is your chance to build a body you'll be proud of! Follow Jowett's easy method of muscle building NOW!

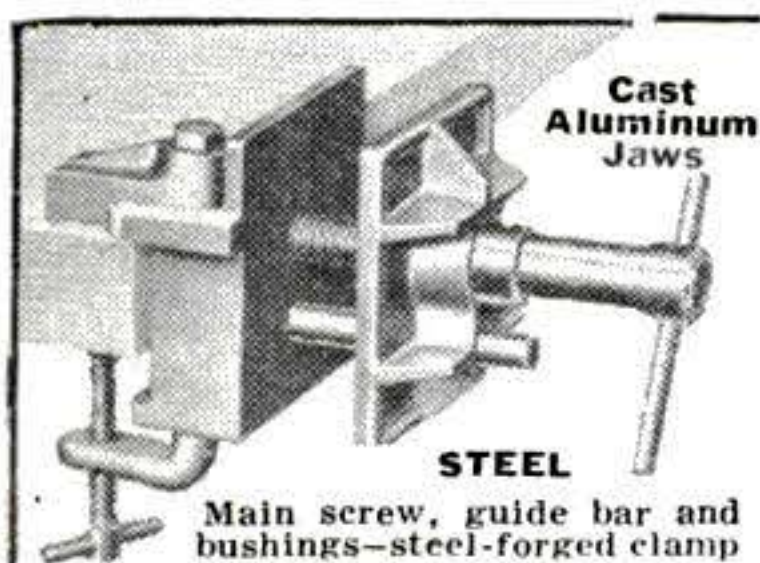
For **25c**



FREE GIFT COUPON!

Jowett Institute of Physical Culture Dept. PS-811
230 Fifth Avenue, New York 1, N. Y.

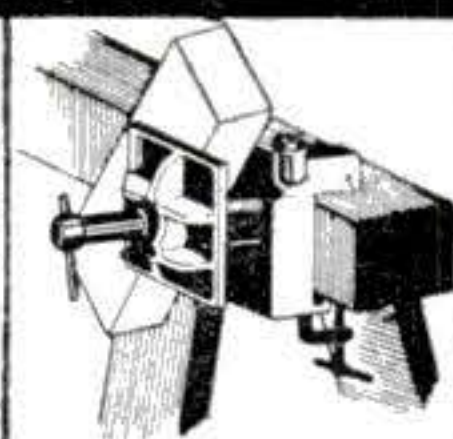
Dear George:—Please send by return mail, prepaid, FREE Jowett's Photo Book of Strong Men, along with all 5 Muscle Building Courses. 1. Molding a Mighty Chest. 2. Molding a Mighty Arm. 3. Molding a Mighty Grip. 4. Molding a Mighty Back. 5. Molding Mighty Legs—Now all in One Volume "How to Become a Muscular He-Man." Enclosed find 25c. NO C.O.D.'S.



HOLD IT *with* PORTO-VISE

Only \$5.85
Postpaid in U. S.

AT LAST! New patented aluminum, light weight **PORTABLE VISE**—Capacity: 2½". For carpenters, hobbyists — anyone who hand saws wood, plastic, soft metals. Fits saw horse, bench, even a plank. Swivel clamp for use in any position, anywhere. Tops as a glue clamp. **SEND FOR YOURS TODAY** — for **YOURSELF**—or as a **GIFT**. Only \$5.85 Post Paid. 10-day, money-back guarantee. Do not delay—Act Now! Send your check or money order to . .



PARENT BROS. DEPT. S—3341 UNION PACIFIC AVENUE
LOS ANGELES 23, CALIFORNIA

REAL SURPLUS VALUES EMERGENCY SUPPLY TANK



Fill at any gas station. 150 lbs. airs 5 flat tires. Inflates rubber boats. Use for touch-up spray jobs, tire service truck, air horns, dust out motors, machinery, etc.

Shatterproof 12"x24" stainless steel tank with carry handle, check valve, two feet

\$795

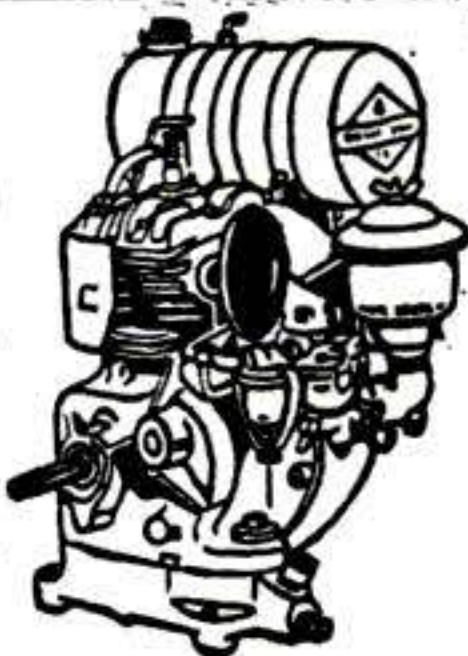
hose and tire filling chuck. Only . . .
Tank only 12"x24", tapped each end ¼" pipe thread. 500 lb. pressure. Build your own. Ideal for paint spray, air receivers, net floats, buoys, etc. Each . . . **\$475**
Small size tank, 6"x24". Only . . . **\$2.98**

BRIGGS-STRATTON ENGINES

1½ HP MODEL N —
GOVT. SURPLUS

In good operating
condition with 30 day **\$39.50**
written guarantee. . . .

Engines will develop almost 2 Hp
at 3600 RPM. Hurry, don't wait,
buy now while limited supply lasts.
Suitable for lawn mowers, garden
tractors, motor bicycles and scooters,
midget cars, etc. Will power
many kinds of machinery.



Trindl "Job Tested" ARC WELDERS

75 to 360 AMP—6 sizes, 11 models \$39.50 to \$285.00.
Model 100B special for Rural and other limited
capacity power lines. Complete. . . . **\$85.00**

"Hydro-jector" WATER INJECTION SYSTEM

For Autos and Tractors

Adds power, more mileage, removes and prevents carbon.
No knock, no ping, on regular gasoline. Easily **\$19.95**
Installed. . . .

PAINT SPRAY EQUIPMENT

W. R. Brown "Speedy". Spray guns, compressors, air regulators,
filters, hose.

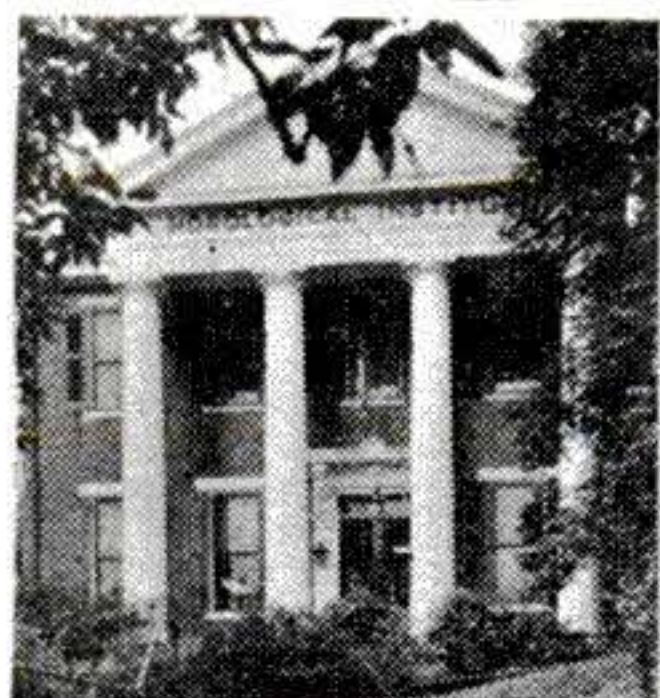
PRICES FOB, K. C. NO COD'S

**MIDWEST
SURPLUS SALES CO.**
2533-X-INDIANA
KANSAS CITY 1, MO.

SEND FOR
**FREE
CATALOG**
HUNDREDS OF VALUES



Say You Saw
It In Popular Science



STUDENTS FROM 44 STATES ARE STARTING A CAREER AT THE WORLD'S LARGEST WATCHMAKING SCHOOL

APPROVED FOR VETERAN TRAINING

Finest training in mechanical profession
of great opportunity. Light, pleasant
work. All phases taught, including elec-

tronic watch timing. Enroll any time, day
or night classes. Nationally accredited
school, established 1936. Every student
bonded upon graduation.

Send for **FREE 36-Page Color Photo Book**

WESTERN PENNSYLVANIA HOROLOGICAL INSTITUTE, INC.
Write Desk 39, 808 Ridge Avenue
Pittsburgh 12, Pa.

\$\$ GET INTO A \$\$ HIGH PAY TRADE NOW

Any skilled workman will tell you that men in the **AUTO** and **HOUSE-**
HOLD trades have the best of it. A steady, profitable business every
month of the year! Now you can learn a trade by a simplified step-by-
step program in Stevinson's shop-classrooms. Learn by **ACTUAL EX-**
PERIENCE with **MODERN EQUIPMENT**, under the guidance of expert
instructors. **26 YEARS** of training and placing men in industry qual-
ifies us as the school for **YOU**. WE ASSIST YOU TO FIND **PART-TIME**
JOBS WHILE ATTENDING SCHOOL. CHOOSE ONE OF THE **TRADES**
LISTED BELOW! Get into a high pay trade the **STEVINSON** way.

☐ **AUTO MECHANIC** ☐ **ELECTRICAL APPLIANCES**
☐ **AIR CONDITIONING** ☐ **REFRIGERATION**

☐ **AUTO BODY AND FENDER REPAIRING**
APPROVED FOR TRAINING OF VETS UNDER LAWS 346 & 16
OPENINGS NOW. WRITE TODAY!!

STEVINSON SCHOOL
2008 Main St. (FSM) Kansas City, Mo.



CORRESPONDENCE COURSES IN
RADIO and ELECTRICAL ENGINEERING

Tuition
\$25

ELECTRICAL ENGINEERING. Get good grasp of
wide electrical field. Modern. Very understandable.
Theory made easy. **RADIO ENGINEERING.** Extra fine course in
radio, public address, photo-electric work. Trains you to be super-
service man, real vacuum tube technician. Tuition **ONLY \$25**, either
course. Deferred payment plan. Servicemen needed badly.

FREE Write for free copies of school catalogs, student
magazines, etc.

LINCOLN ENGINEERING SCHOOL, Box 931, S-119, Lincoln, Neb.

MAKE up to 600 an hour DO RUG WEAVING AT HOME!

Start your own business at home weaving rugs, carpets,
etc. Our **RUG WEAVING LOOM** turns out 2 - 3 rugs every
hour. No experience needed! Spare time weavers earn
\$1000. and more per year, full time operators report
3 - 4 times that amount. Ideal for handicapped people.
Small investment gets you started. Send your Name
and Address **TODAY** for **FREE BOOKLET "WEAVING
FOR PROFIT."**



THE HOME WEAVING COMPANY

137 Oak St.

Lake Ozark, Missouri



BE AN ARTIST

Send for interesting picture book
"BUILDING A FUTURE"

Explains the unique position of the profes-
sional artist in American life. Gives examples
of huge professional income. Tells definitely
how **YOU** can acquire **PROFESSIONAL skill—**
AND PROFESSIONAL INCOME—within one year
—in spare time at home. No obligation. Book is
free. Write name, address and age on penny post-
card and mail **TODAY** to:

GRANT SCHOOL OF ART

Dept. 288, 53 W. Jackson Blvd., Chicago 4, Ill.

Get Ready for Big Opportunities!

Engineer Dobe

**TOOLS AND EQUIPMENT
SENT WHEN YOU START**

Get a better job with more pay and
pleasant working conditions. Get
into **Drafting**—where all products
start. I will train you at home—
give you experience—on the same
kind of jobs you will do with the best paying firms. I furnish instru-
ments and all equipment when you start. Write today for vital facts
and **FREE** book. Give age.

I Will Train You at Home
Until You Get a
**GOOD PAY JOB in
DRAFTING**

ENGINEER DOBE • Dept. 28, Libertyville, Ill.

If Ruptured



Do What Others Now Do—
**Wear a Form Fitting
MILLER Truss**

which provides natural freedom and comfort in working, walking, playing, horse back riding, dancing, swimming or sleeping. You just cannot afford to be without this protection and convenience.

Wear two weeks then consult your physician before deciding to keep it.

Write me today for **FREE**

descriptive circular. Sent in plain, sealed envelope.

FRED B. MILLER Manufacturer
Dept. P.S. Hagerstown, Maryland.

LEARN PIANO TUNING AT HOME

An uncrowded profession... unlimited income... complete independence—your own business with no money tied up in equipment. At home or traveling, work is waiting for you. Learn with sound recordings in 30 days. We provide recordings, instruction book, all necessary tools. Send for detailed information today.

CAPITOL CITY TUNING SCHOOL
211 E. Michigan Ave. Lansing, Mich.

Learn SHOE REPAIRING

PRACTICAL SHOP TRAINING

● Excellent opportunities for good jobs or a successful business of your own. Prepare quickly—practical shop work and shop management taught by experts. Here is a field for a man who wants to be his own boss and build an independent future. Approved for Veterans. Help in finding part time work while a student, employment service to graduates. Write today for **FREE** information.

CHICAGO SCHOOL OF SHOE REBUILDING
124 E. 26th St. Dept. PS-11 Chicago 16, Illinois

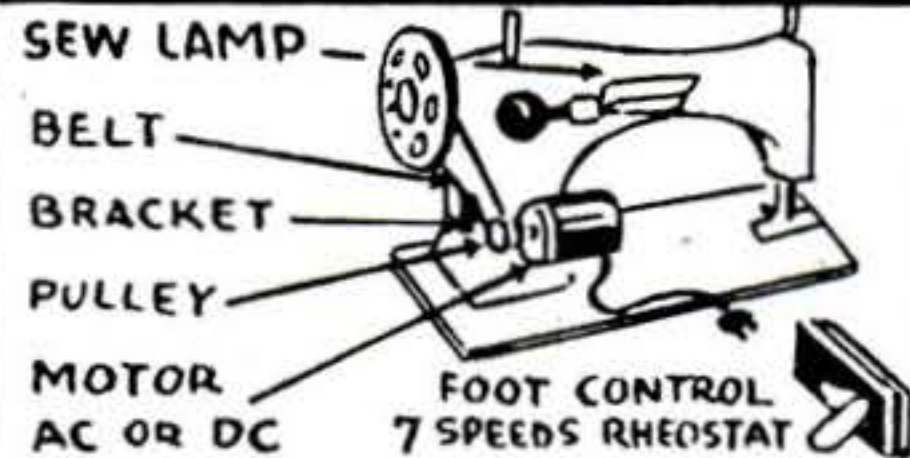
STAMMER?

This new 128-page book, "Stammering, Its Cause and Correction," describes the Bogue Unit Method for scientific correction of stammering and stuttering—successful for 47 years. **Free—no obligation.**

BENJAMIN N. BOGUE, Dept. 4826
Circle Tower Indianapolis 4, Ind.

GET THIS
FREE
BOOK!

MOTORIZE YOUR TREADLE SEWING MACHINE



only **\$15.95**

COMPLETE

FREE SEWING LAMP

A PERFECT GIFT
For MOTHER or WIFE

**MONEY BACK
GUARANTEE**

INSTRUCTIONS INCLUDED
PORTABLE CASES **\$11.50**
For Any Type Machine

DEALER'S INVITED

PS-11 BRANT'S SEWING MACHINE CO., INC.
1720-22 Race Street, Cincinnati 10, Ohio

Rush your \$15.95 kit. My machine is a
Hand wheel turns ☐ toward me ☐ away from me.

NAME _____

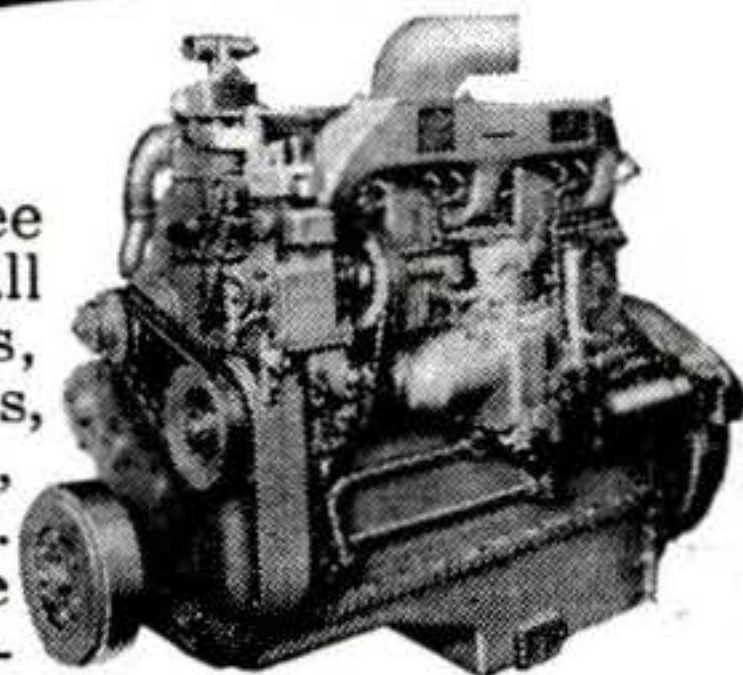
ADDRESS _____

CITY _____ ZONE _____ STATE _____

I am enclosing \$15.95 ☐ check ☐ money order or ☐ send C. O. D. and I pay postman \$15.95 plus a few cents postage.

DIESEL

IS GOING PLACES ARE YOU?



Look around—you will see Diesel Power in action all about you! In tractors, trucks, buses, trains, boats, power and lighting plants, farm and road equipment. Diesel's the Field of the Future! Low cost dependable power—new uses are constantly developing—and every Diesel engine increases the need for Diesel-trained men!

ON LAND



ON WATER



IN INDUSTRY



LEARN DIESEL AT HOME IN SPARE TIME!

If you are over 17, under 60, and mechanically inclined, you can get thorough Diesel instruction right at home. With U.E.I. balanced training, you learn fundamentals first, through home study. Practical, easy-to-understand lessons explain DIESEL operation... fuel systems... how to make repairs... auxiliary equipment, etc.

ACTUAL SHOP PRACTICE



START AT HOME
FINISH IN OUR SHOP

Then, you finish your training on actual engines in our Shop. You work on costly equipment under expert Diesel men who know latest techniques. On graduation, you get job-placement assistance. U.E.I. has 20 years of successful experience in fitting thousands for employment in new opportunity fields.

GET THE FACTS It costs you nothing to get full information on Diesel opportunities and how they can apply to you! **FULL FACTS SUPPLIED FREE.** Simply mail the coupon below now!

**UTILITIES ENGINEERING INSTITUTE
DIESEL DIVISION**



FOUNDED
1927



MAIL THIS COUPON TODAY!

UTILITIES ENGINEERING INSTITUTE, Diesel Division, Dept. 3118-D
2521 SHEFFIELD AVE., CHICAGO 14, ILLINOIS

Please send me **FREE FACTS** about U.E.I. Training Opportunities. I am interested in:

☐ **DIESEL** ☐ **REFRIGERATION**
☐ **AUTO BODY & FENDER REPAIR** ☐ **AIR CONDITIONING**

NAME _____

ADDRESS _____

CITY _____ ZONE or COUNTY _____ STATE _____

[] Check here for special information if you are under 17.

NEW!
HANDY FLEXIBLE SHAFT

ONLY \$2⁹⁵

- Converts Any Motor, Drill Press, Electric Drill, Electric Fan Into A Handy Rotary Tool.
- Attach ROTA-SHAFT in a Jiffy. Can Be Used for Grinding, Polishing, Sharpening, Cleaning, Engraving, Marking Tools, Carving, On Metal, Plastic, Wood, Glass.

YES! Only \$2.95 and ROTA-SHAFT turns your old motor, drill press, electric drill or electric fan (10 inch or larger) with blades removed, into an efficient, versatile Flexible Shaft Tool for doing hundreds of grinding, polishing, sharpening jobs, especially in hard-to-get-at places. Attaches to motor shaft or in chuck. Convenient handpiece for ease of handling. Generous 40-inch overall length. Comes complete with buff and sanding disc ready to use in a drill press chuck. Order today.

OLD FAN MOTOR


YOUR ELECTRIC MOTOR


VACUUM CLEANER MOTOR


SEND NO MONEY! Just mail order. Pay postman only \$2.95 plus postage on delivery, or send \$2.95 and we pay postage. Try 10 Days—if not delighted return for money-back.

If you order Rota-Shaft for use on motor add 35c for Special Coupling and State Shaft Diameter. MAIL ORDER NOW!

STRADER PRODUCTS CO. Dept. G-102
259 Strader Ave. Cincinnati 26, Ohio

NONE BETTER AT ANY PRICE
PAINT YOUR CAR
WITH "Super" CARONIZE
New AUTO ENAMEL SENSATION

- WIPE IT ON!
- NO SPRAYING!
- NO BRUSHING!

ONLY \$2⁹⁵
Enough to Paint Almost Any Auto

GUARANTEED 3 FULL YEARS

You can do a factory-like job. Almost anyone can get high-gloss job that looks like a Professional finish. "Super" CARONIZE does the trick! Easy to apply! No brush! No masking! Simply WIPE IT ON with the applicator that we give you FREE. Get a factory-like finish that's GUARANTEED against chipping, cracking, peeling, fading when simple directions are followed. Dries dust-free quickly.

ONE QUART COVERS AVERAGE CAR WITH 2 GLEAMING COATS. A GLOWING PROFESSIONAL FINISH!

Not a streaky wax or polish. "Super" Caronize is the new miracle high lustre auto enamel that is so easy to use. Anyone can do a professional looking job quickly.

CARONIZE, INC., PS-11, 1800 Singleton, St. Louis, Mo.
AGENTS AND DISTRIBUTORS WANTED

SEND NO MONEY! Order one or more quarts today! Just mail postcard. Pay postman plus C.O.D. upon delivery. Send remittance, save postage.

16 BEAUTIFUL NEW COLORS

Black, Maroon, "Firey" Bright Red, Cloud Grey, "Washington" Dark Blue, Brewster "Dark" Green, Monticello Light Blue, Jewel "Light" Green, Orange, "Lettuce" Light Green, Light Yellow, Tan, Ivory, Chrome, Clear, White.

PRINT YOUR OWN POST CARDS

COMPLETE OUTFIT only \$7.50

Amazing results in sales, inquiries and contacts... saves time and money... very easy to use GEM STENCIL DUPLICATOR is ideal for Advertising, Announcements, Notices, Labels, Forms, Price Lists—hundreds of uses for every type of business and organization. Comes complete with all supplies, instructions and 60-page Book of Ideas.

FREE TRIAL OFFER: Try it before you buy it! Write and a GEM OUTFIT will be sent you postpaid. After 10 days, send only \$7.50 or return the GEM, no questions asked. The GEM must sell itself; you be the judge.

BOND EQUIPMENT CO. • Dept. 151
6633 Enright • St. Louis 5, Mo.

SEND NO MONEY • FREE TRIAL OFFER

WATCHMAKING

Be a Watchmaker—Be Independent

Get practical training at the only school in Chicago accredited by the Horological Institute of America. Day and Evening Classes—Approved for Veterans

Write today for free information

CHICAGO INSTITUTE OF WATCHMAKING
7 So. Pulaski Road Dept. PS-11 Chicago, Illinois

SEND FREE!

HOW to BREAK and TRAIN HORSES

Make money. Know how to break and train horses. Write today for this book FREE, together with special offer of a course in Animal Breeding. If you are interested in Galting and Riding the saddle horse, check here () Do it today—now.

BEERY SCHOOL OF HORSEMANSHIP
Dept. 5811 Pleasant Hill, Ohio

USED BUT REBUILT IN CLEAN, GOOD CONDITION!
ARMY SHOES \$2.59 A PAIR

Now you can wear these sturdy, all weather Army Shoes. Will last and stand up under the toughest wear. Fits comfortably, thick soled, strong leather. Russet tan color only. All sizes. Valued about \$5 a pair. Now only \$2.59 a pair. Also higher top Combat Boots only \$3.75. Special: Both Army Shoes and Combat Boots \$5.98. Send shoe size and width, name and address. SEND NO MONEY! Pay postman on delivery price plus postage. Money back Guaranteed. Order Now! Also send for our free catalog of shoes, hats, suits, army clothes, etc.

EUNICE MAIL ORDER HOUSE
Station B, P.O. Box 101, Dept. PS-N, N. Y. C.

COLOR AT A PRICE YOU CAN AFFORD TO PAY
"PHOT-O-CHROME" 2½ x 3½
"SPARKLING COLOR PRINTS" 50c
Made From Any Ansco, Ektachrome or Kodachrome Transparencies
5 x 7... 2.50 8 x 10... 4.00 (unmounted)
CLEVELAND COLOR SERVICE
3974 EAST 131st STREET CLEVELAND 5, OHIO

LAW FREE BOOK

THE LAW TRAINED MAN

Your FREE copy of "The Law-Trained Man" shows how to gain prestige and greater earnings through Blackstone home law study. All instruction material furnished including 18-volume Law Library written by 65 well-known law authorities. Lawyers, judges among our graduates. LL.B. degree. Low cost; easy terms. Write today.

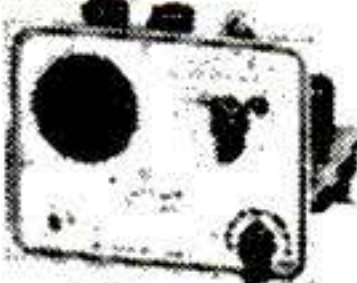
BLACKSTONE COLLEGE OF LAW 225 N. Michigan Ave. Dept. 128, Chicago 1, Ill.
A Correspondence Institution Founded in 1890

Bargains FOR HOBBYISTS AND EXPERIMENTERS

ALL QUANTITIES LIMITED SUBJECT TO PRIOR SALES

HEATHKIT 3 TUBE ALL WAVE RADIO KIT

No. K1. An Ideal Beginners Radio Kit covers 550 to 6000 KC including Broadcast, police, aircraft, amateur marine, and foreign broadcasts. All parts including 3 tubes supplied. 110V 60 cy AC. Transformer operated, calibrated dial complete instructions for assembly. Operates loud speaker (not included). Excellent boy's gift. Ship. wt. 3 lbs. Loud speaker 2½" PM (extra).....\$1.95 Headphones (extra).....\$1.00



\$8.75

BC 645 GENERAL ELECTRIC TRANSCEIVER



No. 201. Complete 15 tube transmitter receiver. Ideal for new citizens band 460 Mc for communication between office and car, home, boat, etc. Conversion

article in August ELECTRONICS Magazine. Brand new in original G.E. cartons with tubes. Add postage for 25 lbs.

\$19.50 2 FOR \$35.00

ACCESSORIES FOR BC 645

PE 101C Dynamotor 110V 60 cycle power supply for car use....\$3.95
110V 60 cycle power supply for home or office use....\$14.50

HOME WORKSHOP GRINDER KIT

No. 230. Easily assembled 110V AC or DC ball bearing fully enclosed motor from Army surplus dynamotor. Purchaser to make simple changes and shaft extensions, detailed instructions and all parts supplied. Motor approximately 5,000 R.P.M. Ideal for tool-post grinder, flexible shaft tool, model drill press, saw. Shipping weight 6 lbs.



\$3.95

ARMY ELECTRONIC ALTIMETER

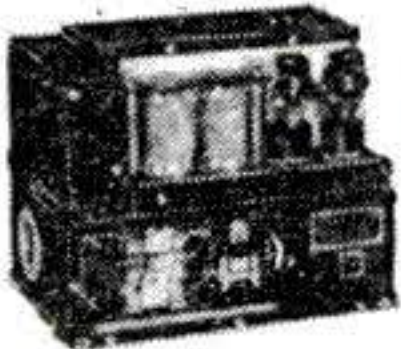


\$34.50

plete with 14 tubes, controls, plugs, antennas and instruction manual. Shipping wt. 87 lbs.

TANK TRANSMITTER POWER SUPPLY

No. 223. Army PE125 power supply provides 500 volts at 160 MA from 12 or 24 Volt storage battery. Heavy duty unit with filters starting relays, fuses, tubes, and diagram. Shipping wt. 73 lbs.



\$12.95

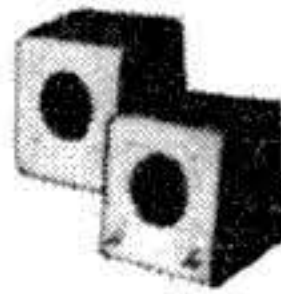
T 32 TABLE MICROPHONE



No. 210. One of the Army's best. Built by Kellogg, ideal for factory call system, public address, amateur use. Brand new in original cartons. Add postage for 5 lbs.....\$2.95

INTERPHONE 2 WAY CALL SYSTEM KIT

No. 1P1. Saves many steps between house and barn, tenant house, workshops, etc.; can be used to watch baby from neighbors. Uses 2 wires and will operate up to 1-5 mile. More than one remote can be used. Kit is complete with tubes, one master, one remote speaker and detailed instructions. Shipping weight 5 lbs.



\$14.50

ASTROGRAPHS WITH CASE



Only \$3.95

No. 259. New B29 navigation instrument which can easily be used to make a good contact printer, strip map holder, etc. The plywood case 14½" x 11" x 10" high is perfect as a tool kit, camera, projector case or for building a portable phonograph picnic kit, make up case, etc., has leather handle reinforced covers, 8 covered compartments in bottom. Cost Gov't \$125.00, Add postage for 20 lbs.

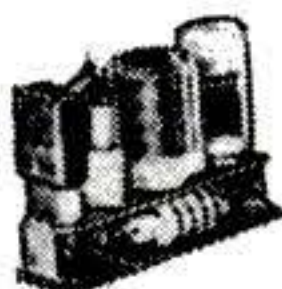
GN 58

GENERATOR

No. 275. Makes excellent home lighting plant, operated by wind propeller, waterfall, gas engine, or hand crank. Reduction gear allows full output at slow speed supplies 6 volts at 2.45 amp., 425 volts at .115 amp. New. Add postage for 28 lbs.



\$7.95



\$1.00

BC 746 TUNING UNIT

No. 257. Transmitter Receiver Tuning Unit from Army Walkie Talkie. Containing coils tuning condenser, transmitter crystal sockets, etc., excellent for building amateur station. Shipping wt. 1 lb.

METER SPECIAL

No. 237. Beautiful Dejur 3" Square Precision Milliampmeter 0-800 MA range, 0-10 MA basic movement. Probably the best buy ever offered in a war surplus meter. Shipping wt. 1 lb.



\$2.95



\$9.95

BENDIX DIRECTION FINDER LOOP

No. 219. Brand new loop excellent for aircraft or boat direction finder. Also useful as radio aerial to eliminate local interference. Rugged army construction. Shipping wt. 8 lbs.

G.E. 50 AMP CIRCUIT BREAKER

No. 204. New General Electric 50 Amp. 220 Volt AC circuit breakers. 100 Amp. when used on 110V. Add postage for 4 lbs. \$2.95, 3 for \$7.50



\$2.95

MINIATURE ELECTRIC MOTOR

No. 211. Tiny Delco motor only 1" x 1¼" x 2" 10,000 RPM. Operates from 6 to 24V. Excellent for models. Add postage for 1 lb.

HEATHKIT HIGH FIDELITY AMPLIFIER KIT

No. A2. A truly fine 110V 60 cy transformer operated High Fidelity Amplifier Kit. Ideal for reproducing quality music at home, churches, mortuaries, outdoor gatherings etc. Output over 10 Watts. Complete with all tubes (push pull circuit) transformers, punched chassis and detailed assembly instructions. Shipping weight 20 lbs.



\$14.95

High Fidelity 12" P.M. Speaker for above \$6.95 Mahogany speaker cabinet size 14½" x 14½" x 8" for above speaker.....\$8.75

BC375 TRANSMITTER TUNING UNIT



\$2.49

No. 203. A beautiful Army Tuner containing 3 precision variable condensers, tank coils, switches, vernier dials, worth over \$30.00. The best buy in surplus. Shipping wt. over 20 lbs.

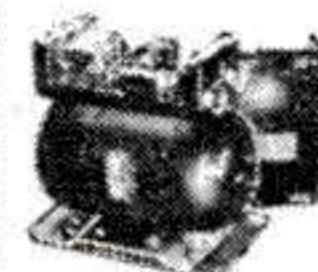
FM PUSH BUTTON TUNER

No. 224. Brand new ten push button tuning assembly from Army FM receiver. Contains 4 gang 100 MMF silver plated tuning condenser. Add postage for 10 lbs.



\$2.50

G.E. 1000 VOLT 350 MA DYNAMOTOR



\$5.95

No. 213. An ideal dynamotor for mobile operation in taxicabs, police cars, sound systems and amateur stations. Supplies above voltage from 12 Volts or 500V. at 350 MA from 6 Volts. Complete with starting relay, and fuses. New. Our Dynamotor A. Shipping Weight 72 lbs.

DM-36 DYNAMOTOR

No. 215. Western Electric 24 Volt input, 220V at 60 MA out. With filter assembly. Ship. weight, 6 lbs.



\$2.95

POWER TRANSFORMER - SPECIAL



\$3.95

3 FOR \$9.95 Weight 11 lbs. each.

No. 226. Primary 117V. 60 cycle. Secondaries supply 746 V.C.T at 220 MA, 6.3V. at 4.5A., and 5V. at 4A. Will handle 13 tube radio receivers. Supply is limited, order early. Shipping

HEARING AID HEADPHONES

No. 216. Hearing aid type, comfortable, keeps out outside noise, one of the Army's best types. Add postage for 2 lbs.....\$1.00



THE NEW 1948 HEATHKIT 5" KIT OSCILLOSCOPE



\$39.50

No. 03. Complete kit to build a beautiful 5" oscilloscope. Ideal for studying and servicing television and FM radio. 6 tubes including 5BP1 cathode ray tube. 1500-Volt power supply operates from 110-V 60 cy A.C. Has compensated vertical and horizontal amplifiers and 15 cy to 30 KC sweep generator. Detailed instructions make assembly easy. Shipping weight 35 lbs. Nothing else to buy.

HOW TO ORDER

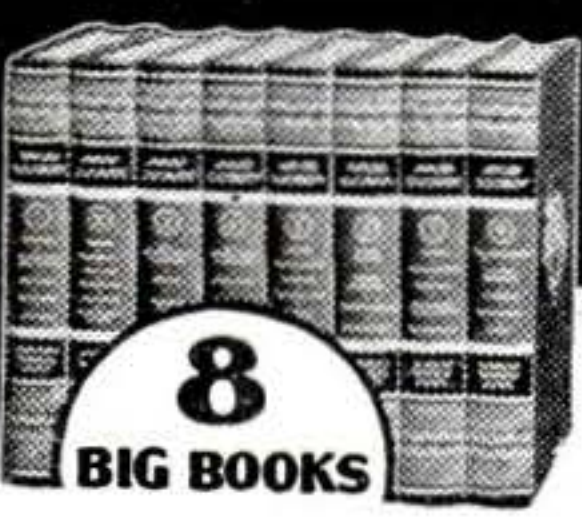
HEATH COMPANY

Give part number and description. Add postage for weight shown. No orders under \$2.00. We will ship C.O.D.

BENTON HARBOR 16, MICHIGAN

ELECTRICAL BOOKS

shipped for
EXAMINATION



8
BIG BOOKS

SEND NO MONEY
MODERN ELECTRICITY
INCLUDING RADIO
AND REFRIGERATION

Here's great news for anyone interested in Electricity. NEW, up-to-date 19th Edition of Applied Electricity with new subjects fully covered, including blueprint reading, electronics, F. M. radio, fluorescent lighting. 8 Big Books sent for examination!

NEW Edition for Beginners and Experts

Over 3700 pages.
2700 illustrations
and 134 tables
in most complete
electrical work we
have published.
Dynamios, motors,
diesel plants,
power stations,
transmission—ev-
erything ex-
plained for easy
understanding.

BIG FIELD! Big Demand! Big Pay!

Men who understand electricity are needed now in all kinds of industries. Practically every business depends on electrical knowledge, and men who know this subject make big money. Learn easily with these new, interesting books. Send coupon for a set of books on approval. See how they will help you to get ahead faster.

SEND NOW [A year's consulting privileges with our engineers now given to all buyers of this famous Cyclopedia of Electricity.]

AMERICAN TECHNICAL SOCIETY
—Publishers Since 1898

American Technical Society, Dept. E820, Drexel at 58th St., Chicago 37

Send for 10 days' free use. 8 volume set of New 19th Edition. Applied Electricity. Including a certificate entitling me to consulting privileges for one year. I will pay the delivery charges only on the books. If I wish I may return them in 10 days and owe you nothing, but if I keep them. I will send \$2.00 after 10 days, then \$3.00 a month until the total price of only \$34.80 is paid.

NAME.....

ADDRESS.....

CITY..... STATE.....

Please attach letter stating age, occupation, employer's name and address, and name and address of at least one business man as reference. Men in service, also please give home address.

Now for EVERY WORK SHOP!

NEW Invention

Electroplates by BRUSH



Easy to Plate CHROMIUM GOLD, SILVER, NICKEL, COPPER ... For Pleasure and Profit!

If you have a workshop—at home or in business—you need this new Warner Electroplater. At the stroke of an electrified brush, you can electroplate models and projects—you can replating worn articles, faucets, tools, fixtures, silverware, etc. with a durable, sparkling coat of metal... Gold, Silver, Chromium, Nickel, Copper or Cadmium. Method is easy, simple, quick. Everything furnished—equipment complete, ready for use. By doing a bit of work for others, your machine can pay for itself within a week. So make your shop complete by getting a Warner Electroplater right away. Send today for FREE SAMPLE and illustrated literature. ACT AT ONCE! Mail Coupon.

WARNER ELECTRIC CO., DEPT. W-14
1512 Jarvis Avenue, Chicago 26, Ill.

FREE Details & Sample!

WARNER ELECTRIC CO., 1512 Jarvis Avenue, Chicago 26, Dept. W-14

Gentlemen: Send Free Sample and Details to:

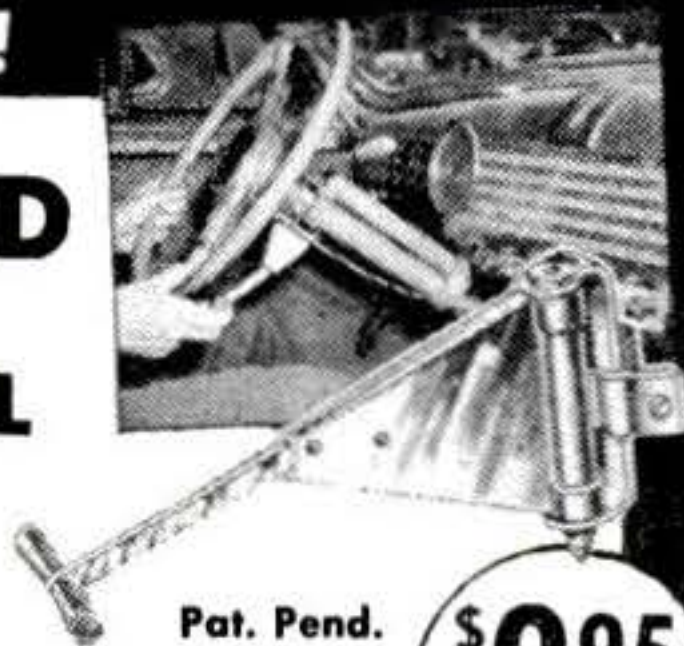
Name.....

Address.....

City..... State.....

Drive Relaxed! with HANDE-FEED Finger-Tip GAS CONTROL

Fits steering post of any car. Connects to carburetor. Simply lift lever to increase engine speed; when released, engine idles. Pivots for use with right or left hand. Does not interfere with gear shift or steering, or cut out foot accelerator. Hand buffed chrome finish. Easy to install. Instructions furnished. Send coupon below.



Pat. Pend.

\$995
POSTPAID

Protection from Burning Sun TUCK-A-WAY AUTO AWNING ASK YOUR DEALER OR ORDER DIRECT



ONE SIZE
FITS ALL CARS

Made of green and white striped waterproof duck. Steel brackets. Screw on top of door yourself. No holes to drill. Theft proof when doors are locked. Folds up for storage in glove compartment. Adjustable for sedans, coaches and coupes.

\$595
PAIR
POSTPAID

TRANS-CONTINENTAL, Inc. DEPT. 5 BOX 3812, St. Louis, Mo.

☐ HANDE-FEED	Send me _____ each of items checked.
☐ AUTO AWNING	
I'm enclosing	Name _____
☐ CHECK: ☐ M. O.	Street _____
☐ SHIP C. O. D. PLUS POSTAGE	City _____ State _____
☐ FREE CIRCULAR	

FUN WITH AMAZING NEW MAGIC DICE

Here's a special pair of fun dice that certainly can do wonders. It's amazingly easy to predict numbers, perform amusing tricks. No one can guess the hidden "secret" unless you tell them! Display amazing "control" yet the real reason is cleverly concealed from everyone. Fun and fascination! Easy directions explain details. Perform many "magic" tricks! Price only \$2.98. Get a pair today. Send no money. Just name and address. On arrival, pay postman only \$2.98 plus postage. Address Hollister-White Co., Dept. 455-D, 215 North Michigan Ave, Chicago 1, Illinois.



Ugly BLACKHEADS OUT IN SECONDS



Keep your complexion free of Blackheads this new way — look attractive instantly!



Try VACUTEX Blackhead-Remover

The amazingly effective Vacutex extracts Blackheads automatically—WITHOUT squeezing the skin or injuring tissues. Easy to use with three fingers. It reaches Blackheads anywhere. Try it 10 days and if not delighted, return VACUTEX and your money will be refunded.

At Your Dealer or Use Coupon

10 DAY TRIAL COUPON

BALLCO PRODUCTS CO., Dept. A-1111

19 West 44th St., New York 18, N. Y.

☐ Enclosed find \$1. Send postpaid.

☐ Send C.O.D. I will pay postman \$1 plus postage; \$1 refund if not delighted.

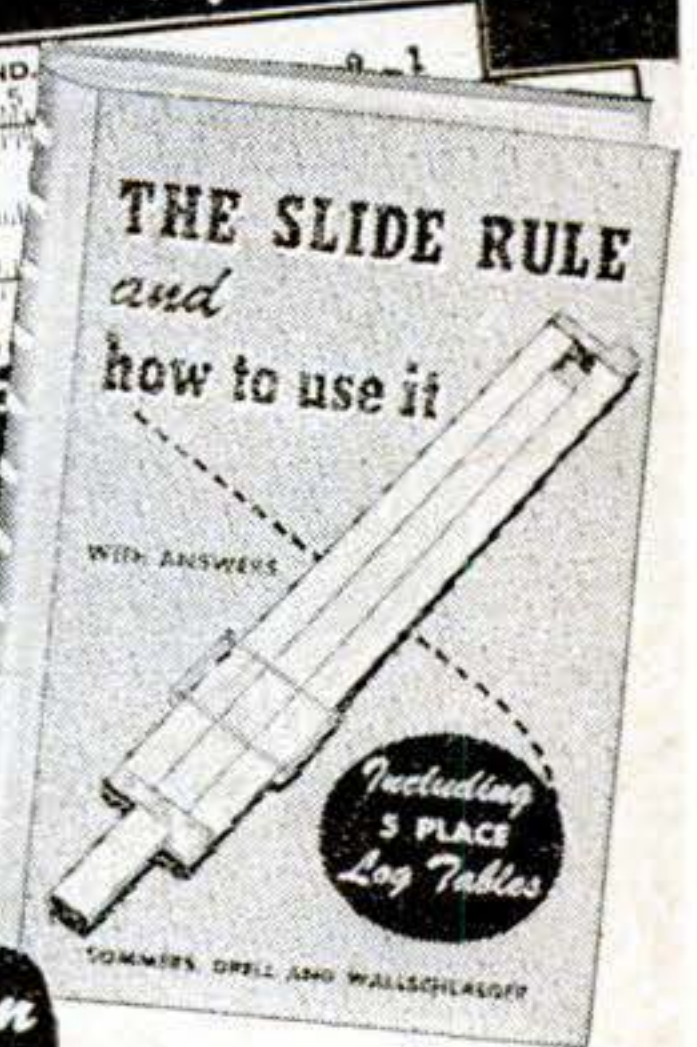
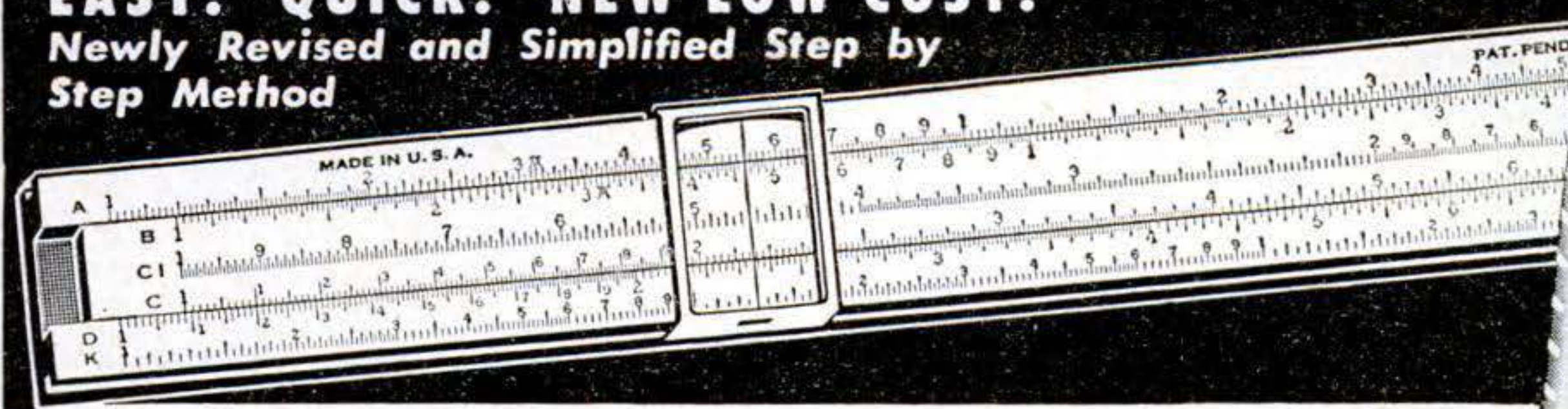
SORRY. NO C. O. D.'s OUTSIDE U. S. A.

Learn to
Use the

SLIDE RULE

EASY! QUICK! NEW LOW COST!
Newly Revised and Simplified Step by
Step Method

**10 in. SLIDE RULE
and Famous
Book Both for Only \$2.98**



Practical Help for Bigger Pay--Better Jobs--for Mechanics, Draftsmen, Shop Men, Accountants--All Who Use Figures

Get this new revised and simplified edition of the "Slide Rule and How to Use It." Thousands of older editions sold at much higher price. Now—a more simplified book at a lower price with genuine full size Mannheim type beginner's Slide Rule included at no extra cost. Do all kinds of figure work. Stop wasted time. Stop pencil errors. Learn quickly to multiply, divide, extract roots, find ratios and percentages, squares, areas of circles, radii, volume, etc. Do it in a flash and learn now with this book and slide rule combination.

Practical Step by Step Guidance

No other book like it. Contains complete instruction and removable work sheets that make the slide rule simple as A.B.C. Also Five Place Logarithm Table, Tables of Trigonometric Functions of Angles, review of Mathematics from simple arithmetic through calculus, and with complete answers to check yourself on every problem. It can easily be worth hundreds of dollars to you in promotions, better pay, saving time and error. It's a book for students, mechanics, business men—everyone should learn to use the slide rule, now that it is so easy.

Learn in a Few Hours to Do Many Calculations

There is nothing mysterious about the slide rule and its use. Just read the book and follow the rules. You'll be amazed at the problems you can solve in just a few hours. Mail the coupon now. Book and slide rule will be sent at once. Use them for 5 days, then if you are not satisfied in every way, return them and your money will be refunded without delay. Use the coupon. Mail now.

**208 PAGES
LOG TABLES
Helpful Review
of Mathematics**

**Mail Coupon
Money Back if
Not Satisfied**

**Austin Publishing Co., Dept. 28
165 N. Pine Ave., Chicago 44, Ill.**

Send me "The Slide Rule and How To Use It" and 10" full size Mannheim type beginner's Slide Rule. Total cost for both \$2.98. I understand you will refund amount paid you if I return them in 5 days.

☐ Remittance Enclosed ☐ Send C.O.D. Postage and Charges Extra
Send Postpaid

Name _____

Address _____

City _____ State _____

AUSTIN PUBLISHING CO., Dept. 28, 165 N. Pine Ave., Chicago 44, Ill.

WHICH OF THESE *Opportunities* INTERESTS *You* MOST?

● *Today*, choose the job you want—and prepare for it. Or if you are already engaged in the work you like best, start training *now* for quicker promotion. Acquire the knowledge that will help you to get ahead faster, make more money and have greater security.

American School, founded in 1897 as an educational institution *not for profit*, can help you to reach your goal just as it has helped others during the past fifty-one years. Check the coupon at right, add your name and address and mail it at once. The school will send you details on its training plan and outline of study prepared by specialists. There is no charge, no obligation, so send the coupon immediately.

CHECK, CLIP AND MAIL COUPON NOW

AMERICAN SCHOOL, Dept. G846, Drexel at 58th, Chicago 37, Ill.
Without obligation, Please send FREE and postpaid, bulletin and details of the Subjects checked:

- | | | |
|--|--|--|
| ☐ PLASTICS ENG'R | ☐ Accounting | ☐ Drafting and Design for Men and Women |
| ☐ Refrigeration | ☐ Electrical Engr. | ☐ Radio |
| ☐ Architecture | ☐ Electricity-Pract. | ☐ High School |
| ☐ and Building | ☐ Electronics, Industrial | ☐ Air Conditioning |
| ☐ Contracting | ☐ Bookkeeping | ☐ Mechanical Eng. |
| ☐ Practical Plumbing | ☐ Private Secretary | ☐ Shop Management |
| ☐ Automotive Engr. | ☐ Diesel Engineering | ☐ Tool Making |
| ☐ Aviation Drafting | ☐ Sheet Metal Pattern | ☐ Better Foremanship |
| ☐ Aviation | ☐ Drafting | ☐ Machine Shop |
| ☐ Business Management | ☐ Railway Training | ☐ Operations |

Name _____ Occupation _____

Address _____ Age _____

City _____ State _____

AMERICAN SCHOOL

Dept. G846, Drexel at 58th Street, Chicago 37

NOVEMBER 1948 47



MADE \$14 PER DAY While Still Learning

"By the time I finished half your course, I was making \$14.00 per day. I have made enough on the side to more than pay for the course—"
T.E.H.—West Virginia

LEARN ELECTRIC APPLIANCE

We Teach
How to Repair
Washing
Machines
Vacuum
Cleaners
Electric Ranges
Lamps, Motors,
Irons, etc.
REFRIGERATION
and
House Wiring
At Home
In Your
Spare Time!

REPAIR & SERVICE

For a man handy with tools, and happiest when working with his hands, OPPORTUNITY is Wide Open Today in this great and growing field. Everyone is a customer for the man trained to service electric appliances.

OPEN YOUR OWN SHOP

Our practical HOME COURSE teaches you this business from A to Z—preparing you to take a well paid job or open your own shop. You can actually start in your basement or garage with the tools I send you . . . before finishing.

I Include A
BIG KIT
of special
appliance
tools at

NO EXTRA COST

MAIL THIS COUPON for FREE BOOK

PACIFIC TRAINING SCHOOL
7217 So. Broadway, Dept. S-811, Los Angeles 3, Calif.

Dear Sirs: Please send me, without obligation, your free booklet and complete details.

Name.....

Address.....

City.....State.....

BUILD WITH MODEL-OF-THE-MONTH CLUB Exclusive MODEL KITS EDUCATIONAL • RECREATIONAL • HOURS OF FUN

FOR EVERY
MODEL-MAKER
HOBBYIST

•
EXCLUSIVE
MODELS AND
PROJECTS

•
LEARN
MECHANICS
EASY WAY

•
IDEAL GIFTS
FOR XMAS OR
BIRTHDAYS

•
COORDINATE
HAND AND
MIND

•
DEVELOP
CREATIVE
ABILITIES

HERE'S a New Idea just developed by the originators of the World Famous Gadget-of-the-Month Club. A club for model-makers. Members who qualify receive each month, for the period of their membership, a "surprise" model or project kit, which contains all the parts necessary for hours of fun in building with their hands. It's a brand new idea. All models and projects are Exclusive for Members ONLY. No kit has ever been offered for public sale EVER. Imagine the fun you'll have building with these kits.

COMPLETE KITS AND INSTRUCTIONS

Each kit or project contains all the necessary parts or components necessary for completion. All you need are a few small hand tools, which you probably have. Easy-to-follow, illustrated instructions make assembling Easy, Fun, Educational.

MEMBERSHIPS MAKE IDEAL GIFTS

Memberships in this exclusive model-makers club make perfect gifts for men or boys from 15 to 50. It's a gift that's different—A gift that is really appreciated—and anticipated each month. Many of today's top executives are model-builders. Great inventors often got their start this way.

CHOICE OF MEMBERSHIPS AVAILABLE

One years membership for \$10 brings a kit every month. Six-month membership for \$5.50 brings a kit every month for six months. For hours of fun, education and recreation JOIN TODAY. Act Now by sending in your order with cash, check, money order or postal note. This offer is LIMITED and will be revoked when membership quota is filled. SEND IN COUPON TODAY.

INTERNATIONAL MODEL-OF-THE-MONTH CLUB

(A division of Gadget-of-the-Month Club, Inc.)
6600-A Lexington Ave., Hollywood 38, Calif.

Enclosed find ☐ \$10 ☐ \$5.50
For One Year For 6 months

Name.....Age.....

Street.....

City.....



Free Leathercraft

instructions

All materials for making easy-to-assemble leather goods. Free instructions included. No experience necessary.

MAKE AS GIFTS—OR TO SELL

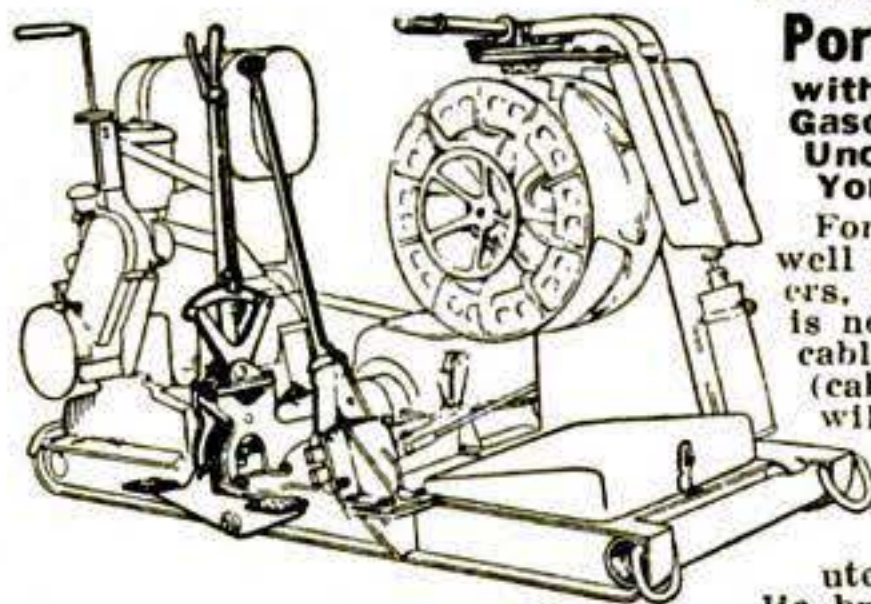


Belts, gloves, purses, wool-skin toys and mittens, 100 other practical, money-making items. Largest complete stock of leather and leathercraft supplies in America. Immediate delivery.

Send 10 cents for new catalog of gift suggestions and profitable ideas. Write today.

J.C. LARSON COMPANY

826 S. Tripp Avenue, CHICAGO 24, ILL.



Save 70% on Brand New Portable POWER WINCH

with 2 cyl. 11 H.P. Waukesha Gasoline Engine. Cost Uncle Sam \$1150 each. Your Price.....\$342.50

For building contractors, water well drillers, coal mines, tank builders, farmers—wherever a real winch is needed. Drum carries 400' of 3/4" cable or equivalent in other sizes (cable not furnished). In low gear will handle 2000-2500 lbs. at 167' per minute. In high gear, 500-850' lbs. at about 590' per minute. Motor capable of 5000 lbs. at slower line per minute. Free wheeling drum, Hydraulic brake. Standard automotive parts

and other available parts from winch manufacturer. Motor alone worth \$180. Will last for years. Similar winches sell now for \$1600. Save 70% or more. Guaranteed brand new with tools, parts list, 32 accessories in all. Ready to ship. \$342.50 FOB Cincinnati. Net wt. 1070 lbs. Shipping wt. 1650 lbs. Net size about 41"x42"x64". Use, or resell them at nice profit. You need to act! Send 25¢ deposit. Bal. COD subject to inspection. These will sell fast!

SOUTHWESTERN CO. 303-5 N. Harvey St.
"Since 1902"

2-1115 Okla. City, Okla.

WATCH REPAIRING

BE A MASTER WATCHMAKER!

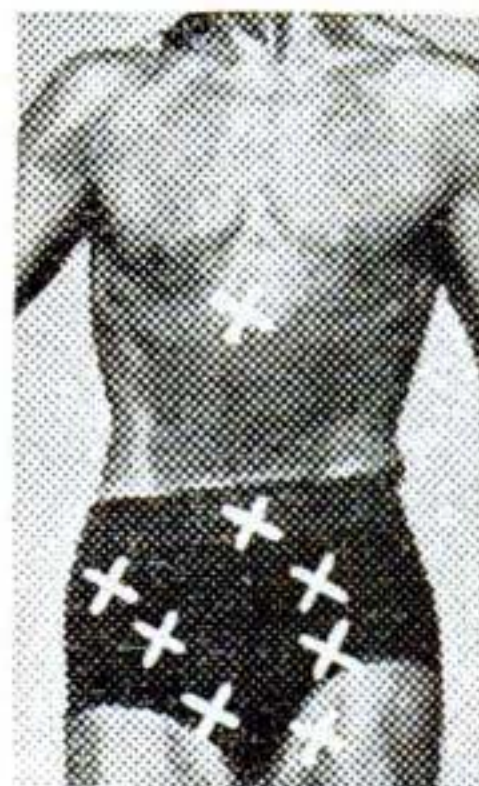
Graduates earn big money—many in business for themselves. The famous Sweazey System of Instruction teaches you quickly and easily. Our 41st year. Write today for free information.

CHICAGO SCHOOL OF WATCHMAKING

Dept. 4118 1508 Milwaukee Ave. Chicago 47, Illinois

LOOK for Rupture Help

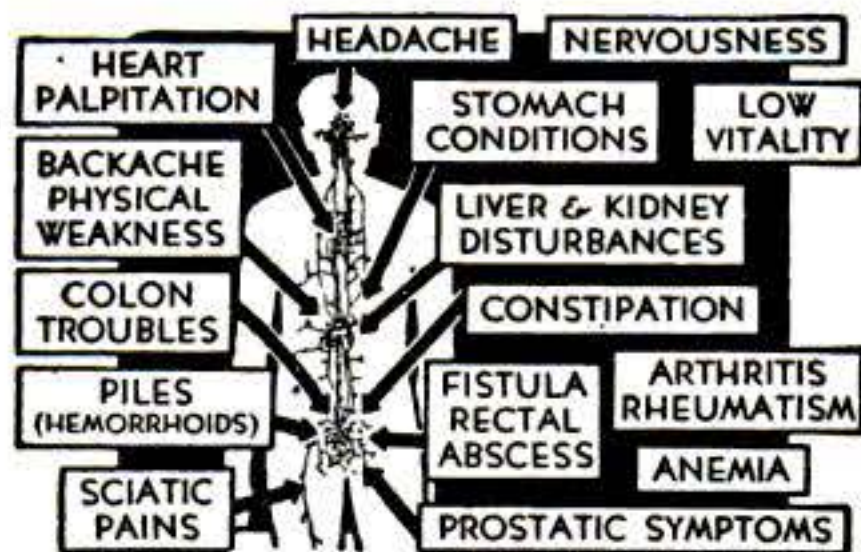
Try a Brooks Patented Air Cushion appliance. This marvelous invention for most forms of reducible rupture is GUARANTEED to bring YOU heavenly comfort and security—day and night—at work and at play—or it costs you NOTHING! Thousands happy. Light, neat-fitting. No hard pads or springs. For men, women, and children. Durable, cheap. Sent on trial to prove it. Not sold in stores. Beware of imitations. Write for Free Book on Rupture, no-risk trial order plan, and Proof of Results. Ready for you NOW!



BROOKS APPLIANCE COMPANY
Dept. 163-C State St. Marshall, Mich.

Piles May Lead to Chronic Ailments

FREE BOOK — Explains the Causes and Effects



No obligation. Write to Thornton & Minor Clinic, Suite 1149, 926 McGee St., Kansas City, Mo.



WAKE UP YOUR SCALP Want better looking hair? Embarrassed by falling dandruff, itching scalp? Get the new VITABRUSH, the electric-automatic brush with built-in brush head motor... gives scalp and hair an invigorating "workout" in just 3 minutes. Cleans scalp, stimulates blood supply, distributes the natural oils. Fun to use—relaxing. Write for satisfaction-guaranteed offer—today. Hershey Mfg. Co., 3756 Field Bldg., Chicago 3.

IT'S EASY TO "BUILD A CLOCK"!

Quickly, easily, build this handsome, excellent timekeeper. Not a toy! A regular wall clock! Educational, instructive. For homes, offices, stores and schools. Durable ebony black case with contrasting silver hands and numerals. Harmonizes with any room plan. Diameter of face 5½ inches! No special tools needed... only a screw driver. Anyone who can read can make it! Only 21 parts, yet guaranteed to give years of accurate, dependable service. Shipped in gift box. Sent postpaid for only \$3.95. C.O.D.'s plus charges.

UNITED PRODUCTS CO.
7941 S. Halsted, Dept. BC-101, Chicago 20

Be a MAGICIAN

Learn this fascinating hobby by mail—the EASY way. You can amuse and mystify your friends FROM THE FIRST INSTRUCTIONS, which clearly detail magical secrets. 10¢ brings full details, illustrated magic catalogue, and a neat Pocket Trick. If already a magician, you will revel in our magic catalogue.

CALIFORNIA MAGIC DEPOT
2491 Telegraph Ave. Dept. S-8 Berkeley, California

ELECTRICAL TRAINING

Intensive 32 weeks residence course in fundamentals of industrial electrical engineering, including radio, electronics. Prepares for technician, engineering aides. Approved for veteran training. 56th year. Enter Nov. 22, April 4. Write for catalog.

BLISS ELECTRICAL SCHOOL
7620 Takoma Ave., Wash. 12, D.C.

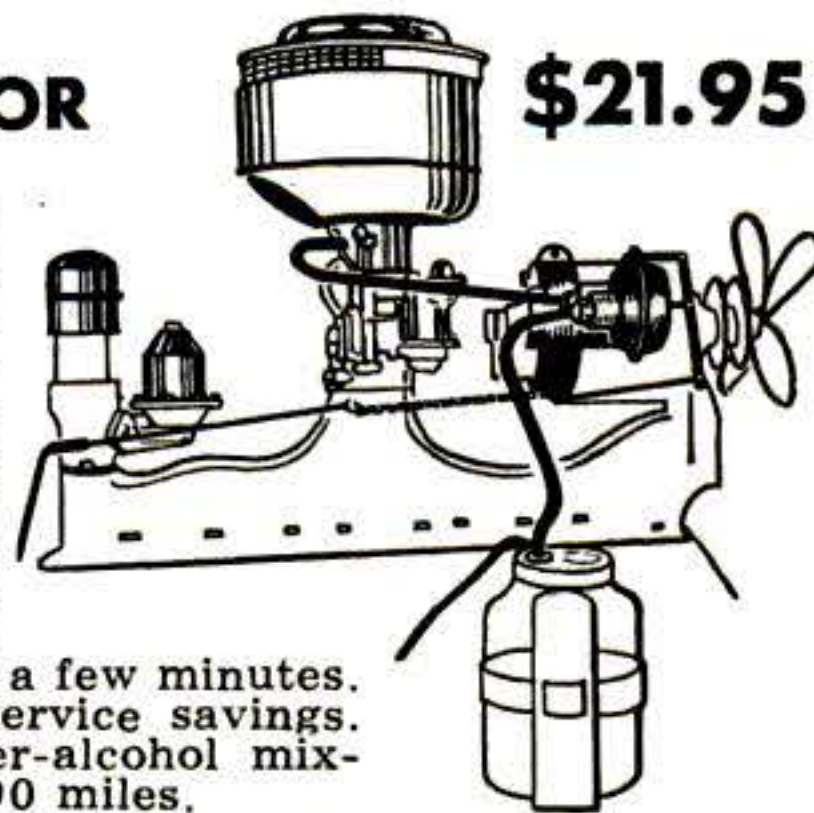


SENSATIONAL VALUES IN NEW EQUIPMENT

HYDRO-JECTOR

\$21.95

More power, cleaner engine, saves fuel and oil. Amazing acceleration. Developed for war planes. Time tested for motor cars. Injects a metered quantity of water and alcohol into carburetor during acceleration. Simple and easy to install, requires but a few minutes. Pays for itself in service savings. One gallon of water-alcohol mixture goes 400 to 600 miles.



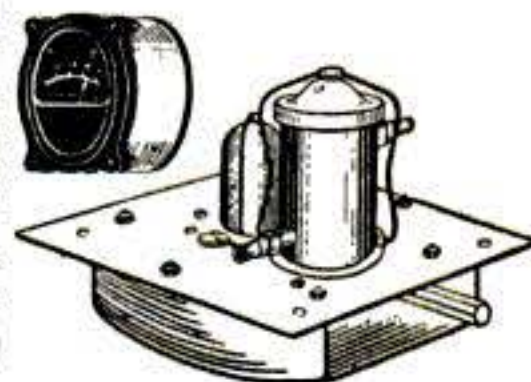
HYDRAULIC CYLINDER



Bore 1-7/16 in., stroke 4 in. Aluminum construction, stainless steel interior. Standard ¼ in. pipe thread connections. Ideal for lifting, bending, tilting, pulling, pushing, etc. Can be converted into fluid pump, air compressor or air engine. A real labor saver. Only **\$2.95**

EXHAUST ANALYSER Electric

Tells right on the dash whether your engine is running rich or lean. Available in 12 volt and 24 volt units. Saves fuel. Keeps you informed of your engine's condition. Unit mounts under hood with dash indicator. A money saver for truck operators. Complete **\$25.00** Each



IDENTIFICATION LIGHTS



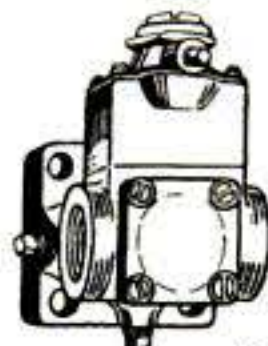
Genuine aircraft identification lights, red-green-amber, flush mounting, 5" diameter including mounting flange. A natural for truck and trailer use. Also clear streamline light. Each **75c** Lots of 10, each **50c**

SWITCH BOX

Three single pole, double throw switches, 1 micro switch, 1 light and 1 shutter, mounted in plastic box 3½" x 3" x 1¾". **\$1.00** Each... Lots of 10, each **75c**



FLUID PUMP



Vane type, for oil, gasoline, alcohol, etc. 400 gal. per hour capacity at 25 lbs. pressure. ¾" pipe outlets. Used, serviceable condition. Each **\$5.00**

HYDRAULIC PRESSURE GAUGE



0 to 2000 lbs. pressure, luminous dial, plastic body, 2⅜" square mounting, 2¼" base diameter **\$2.00** Each... Lots of 10, each **\$1**

HYDRAULIC VALVE LIFTER UNIT TESTER



For automotive and light aircraft. Complete with 2 Master Hydraulic lifters. Cost the **\$10.50** Govt. over \$25. Only

IMMEDIATE DELIVERIES

All above items shipped F.O.B. Cleveland. Send check or Money Order. No C.G.D. Write for quantity prices on any item.

WAAG ENTERPRISES

3106 Broadview Rd. Cleveland 9, Ohio

MEN and
WOMEN



HIGH INCOME TRAVEL • ADVENTURE

...await in World Trade. Work for others or start your own full or part time business in this big-money industry. Your home can be your office. Buy and sell world-wide without capital by mail order as I have. My practical low cost home study course teaches you quickly at home. World Trade is a common sense business which I teach you in a common sense way, based on *my own twenty-five years' practical experience*. Simple words—clear instruction. No need to know or learn a foreign language. No previous special experience or schooling needed. World Trade Certificate awarded. Authorities predict that the *Marshall Plan will expand U. S. Exports* to \$60 BILLION over the next five years; also billions in Imports will result. World Trade now offers the biggest opportunities in history for newcomers. Send today for FREE INFORMATION. Airmail reaches me overnight.

MAIL FOR FREE DETAILS

B. L. MELLINGER, Director, The Mellinger Co.

1422-BY WESTWOOD BLVD • LOS ANGELES 24, CALIF.

SEND FREE LITERATURE ABOUT MY OPPORTUNITIES IN WORLD TRADE

NAME _____

ADDRESS _____

CITY _____

STATE _____

VETERAN? _____

OCCUPATION? _____

AGE? _____

FREE HOBBY BOOK

For MEN and BOYS
TELLS HOW TO LEARN TO
MOUNT BIRDS

and animals, fish, pets, and all game. Learn to TAN SKINS with wonderful Krome-Tan. Simple as ABC. Many earn big PROFITS in spare time mounting for others. Great FUN. Wild game not needed. Over 500,000 students since 1903. RUSH postal TODAY for STRANGE BOOK, over 100 game pictures. FREE. No obligation. State AGE! N. W. School of Taxidermy, 2671 Elwood Bldg., Omaha 2, Neb.



THERE'S MONEY IN CARTOONS!

DON'T COPY—LEARN TO ORIGINATE!

RAYE BURNS will teach you HOW to CREATE ORIGINAL CARTOONS at home that you may SELL! Course contains 26 lessons and over 600 illustrations. All for only **\$2.85**. Send name and address for free details.

RAYE BURNS SCHOOL, Dept. S, Box 3583, Cleveland, Ohio

ONE YEAR WRITTEN GUARANTEE!

ARMY AIR CORPS 16 JEWEL

ELGIN

\$19⁹⁵



Made for Pilots and Navigators of the U. S. Army Air Forces. They had to be good. Sturdy 16 Jewel Elgin men's wrist watches. Shock resistant. Sweep second hand. Luminous hands and dial. Stainless steel back. Unbreakable crystal. Water repellant. Made by ELGIN one of America's outstanding watch manufacturers. Fully reconditioned. One year written guarantee sent with each watch. Supply limited! **SEND NO MONEY**. Simply pay postman \$19.95 plus 10% tax and postage on delivery. Cash orders sent postpaid. United Products Co., 7941 S. Halsted, Dept. RES-1120, Chicago 20.

PRODUCTS WANTED!

For Manufacture and/or Sale

We are interested in outright purchase, royalty, or franchise for manufacture and sale of all types of products, with special interest in tools and shop items. Our facilities are complete: design, engineering, manufacturing, sales and management. We can develop your idea!

THOMPSON ENGINEERING CO.

214 Winchester Pl.

Grand Rapids 2, Mich.

SUIT YOURS AS A BONUS



And Big Money in Spare Time, Too

We want you to wear this fine made-to-measure suit! Make it yours by sending a few orders, and earn BIG CASH PROFITS in spare time. Your suit will help you get more orders with scores of rich, quality fabrics, tailored-to-measure to newest styles. Also Ladies' Tailored Suits—complete line. Write today for FREE SAMPLES. No experience, no money needed. For quick action tell us about yourself.

J. C. FIELD & SON, Inc.

Harrison and Throop Sts., Dept. L-1721, Chicago 7, Ill.



Treasure and Mineral LOCATORS

Low priced, unsurpassed in efficiency, lightweight models. Miniature batteries and tubes. Credit plan available. Free literature. Dept. PS-108.

FISHER RESEARCH LABORATORY Inc.,
Palo Alto, Calif.

LOOK!

\$1.00

FIN-DER

SAX-SLING

NEVER SLIP OR KINK
HIGH SPEED ADJUSTING
BALLBEARING

AT ALL GOOD DEALERS
OR ORDER DIRECT

FIN-DER 1253 - 4th Avenue, San Diego 1, Calif.

NEW!

CIGARETTES ALL POPULAR BRANDS

Postage paid on orders of five cartons or more. Add 5¢ per carton on orders of less than 5 cartons. Send check or money order.

\$1.57
PER
CARTON

A-ONE TOBACCO CO.
★ BONDED ★

2246 Quincy, Dept. G • Kansas City 1, Mo.

Let Us Teach YOU to Write

Read these experiences: **WAITER SELLS NOVEL:** A Magazine Institute Student, working as a waiter, recently signed a contract for his first novel, with an advance of over \$1000—after completing only half the assignments of the course. **HOUSEWIFE GETS \$300 CHECK:** A Virginia housewife, after working a few months, in spare time, with the Magazine Institute, sold her first story to a woman's magazine for \$300. (taken from MI files).

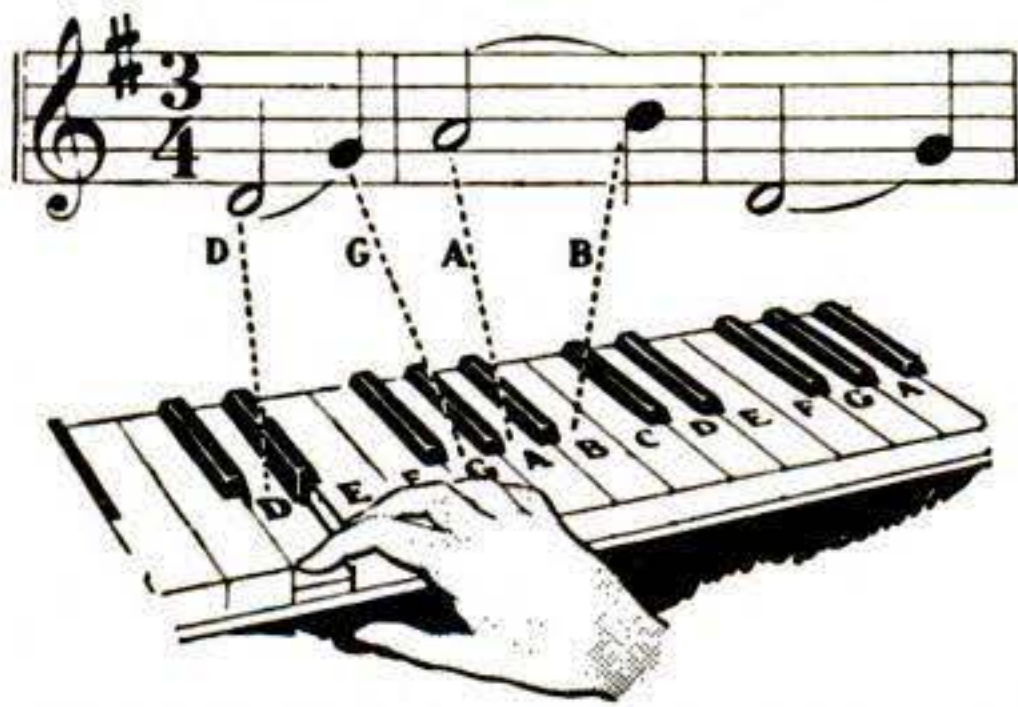
The Magazine Institute, Inc., Dept. 4611, 50 Rockefeller Plaza, Rockefeller Center, New York 20, N. Y.

The Magazine Institute, a private school owned, operated, and staffed by successful writers and editors, offers an up-to-the-minute course in writing for magazines, which makes it easy for beginners to get started in this rich field. You work in spare time at home. Fiction or non-fiction. Send today for **FREE CATALOG**. No obligation.

VETERANS: Send for special form (this course approved).

TO THOSE WHO THINK LEARNING MUSIC IS HARD

Just strike these notes and you're playing the beginning of the "Merry Widow" Waltz



Look at the diagram. The first note of the music is "D." Following the dotted line to the keyboard you'll find "D" is the white key between the two black keys near the middle of the keyboard. Now read below how you can learn to play any instrument quickly and easily.

EASY AS A-B-C — COSTS JUST A FEW CENTS A DAY!

● Perhaps you think learning music is a tedious grind. It isn't any longer! Long hours of practicing scales and monotonous exercise are over.

You have no excuse for not getting started toward musical good times now! For through an easy method you can now learn to play right at home—without a teacher—for a few cents a day.

Learn to Play by Playing

The lessons come to you by mail from the famous U. S. School of Music... complete instructions, clear diagrams, and all the music you need. You learn to play by playing real tunes by note. First you are told how to do a thing. Then a picture shows you how. Then you do it yourself and hear it. Remember, don't confuse our method with any system claiming to teach music "by ear" or by trick methods. We teach you to play only from real notes!

SUCCESS!

Here's what one of our thousands of pupils writes: "I learned more from your course than many of my friends who studied under private teachers have for years. The fact that I've already taken 2 courses and am now enrolling for a third, should speak for itself." F. A. S., Indiana.



Don't delay. Send now for our illustrated Free Booklet and "Print and Picture" Sample which fully explain this remarkable method. So decide which instrument you want to play and mail the coupon today. U. S. School of Music, 811 Brunswick Bldg., New York 10, N. Y. (Successful 50th Year)

FREE! Print and Picture Sample

U. S. School of Music, 811 Brunswick Bldg., New York 10, N. Y.

Please send me Free Booklet and Print and Picture Sample. I would like to play instrument checked below.

☐ Piano	☐ Saxophone	☐ Modern Elementary
☐ Guitar	☐ Trumpet, Cornet	☐ Harmony
☐ Hawaiian Guitar	☐ Reed Organ	☐ Mandolin
☐ Violin	☐ Tenor Banjo	☐ Practical Finger
☐ Piano Accordion	☐ Clarinet	☐ Control

Name..... Have You Instrument?.....

Address.....

City..... State.....

Save 2c—Stick Coupon on Penny Postcard



You too can make these beautiful copper pictures and plaques right in your own living room.

BIG PROFITS!

*Can be Yours...
Right in Your Own Home*

No Experience Needed

At last a way to get in on the Big Money made every day in Copper Art—Plaques—Bowls—Trays—Gifts—Souvenirs of all kinds. *No art talent necessary*—our NEW METHOD makes it so easy, even a child can do it. Big Markets waiting. Anyone can learn quickly—you start making money right from the start. Don't miss this opportunity to cash in at once on this big-paying easy to operate business. Be your own boss. SEND NO MONEY—act NOW to get all the free details—just send your name on a penny postcard today—Do it Now! Write today—

HOLLYWOOD COPPER ART STUDIO Dept. S

No Selling
Money-Back
Guarantee

7266 Sunset Boulevard
Hollywood 46, California

**Say You Saw
It In Popular Science**

PRECISION JEWELERS SCREW DRIVERS

Complete Set of 8 for Every "Hobbyist"

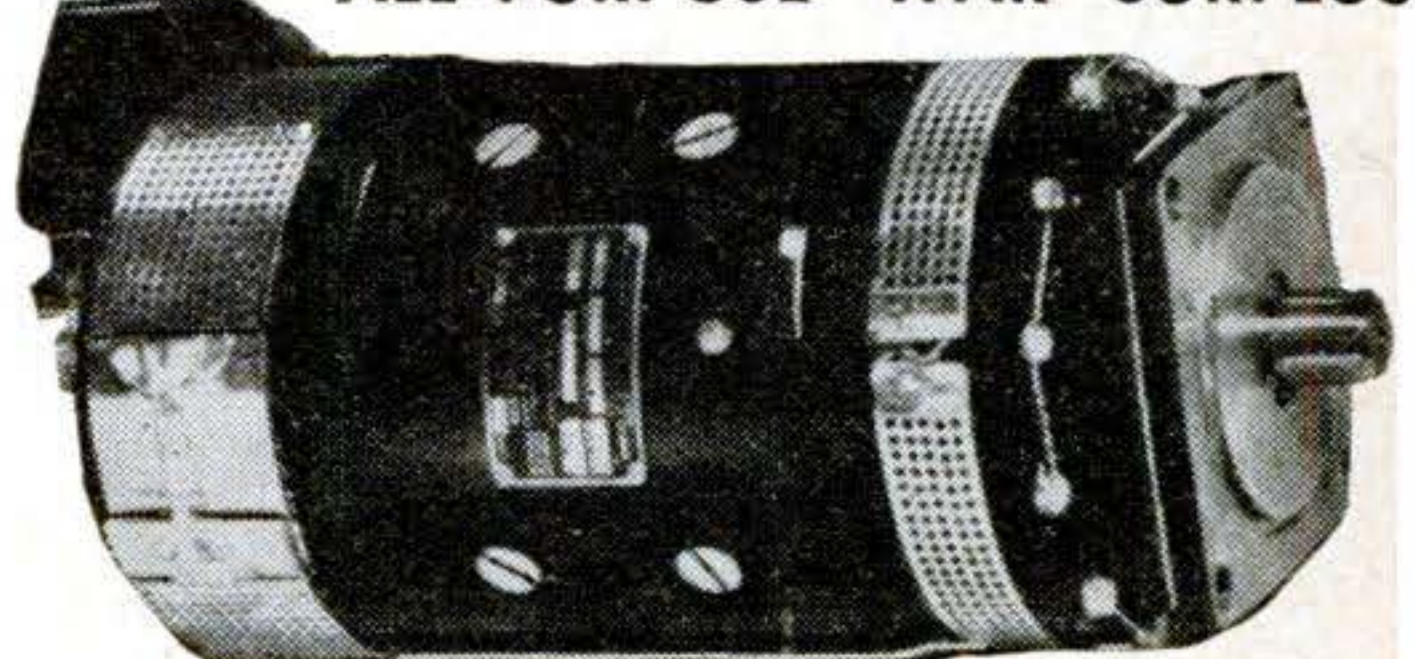
THE IDEAL XMAS GIFT FOR EVERY HOBBYIST!



At last—a complete set of precision screw drivers to meet the needs of every model builder. Not a miniature but the same type set used by U. S. Navy for precision instruments and watches during the war. Brass knurled handles, hexagon heads, finest tempered steel blades. Sizes 2-9. Never before a set of this quality and precision at such a low price. Your money back if not satisfied. C.O.D. \$2.00 plus postage or send \$2.00 and we pay postage.

PINE WATCH CO., Rm. 40, 29 Eldridge St., New York 2, N. Y.

ALL-PURPOSE WAR SURPLUS



AVIATION GENERATOR

● Made by Eclipse Pioneer, Div. of Bendix Aviation.	● Length 14", Diameter 6"
● Type 314, Model 31, Style A	● 7/8 O.D. 1" length shaft
● Guaranteed BRAND NEW, Perfect	● Packed in original crates
● 30 Volt 50 Amp. 1500 Watt	● Min. R.P.M. 2600. Max. R.P.M. 4000

Ideal for Boat Lighting, Battery Charging, and many other uses.
Original Cost \$170.00 Each. Cash or Check with order prepaid in U. S. A. Net weight 34 lbs. Ship. Wt. 50 Lbs.

**\$19.95
EACH**

NORTH AMERICAN SALES INC., Dept. PS-2 8. So. Dearborn St. Chicago 3, Ill.

LINGUAPHONE



is your *Passport*
to the World

in your own home, alone or in a group, you can now learn to speak

**SPANISH • PORTUGUESE
FRENCH • RUSSIAN
ITALIAN • GERMAN**

or any of 23 other languages by the world-famous

LINGUAPHONE Conversational METHOD

You simply *listen* to the cultured voices of native teachers. You *repeat* what you hear, guided by what you see in the text and pictures . . . you answer and ask questions . . . and in an amazingly short time you're conversing in the new language.

Educators and language teachers regard Linguaphone as a notable advance in modernizing and simplifying the study of languages. That is why so many Linguaphone sets are in use in schools, colleges, universities, as an aid to fluent speaking.

Available to Veterans under G I BILL OF RIGHTS

Save time, work and money, learn a new language the Linguaphone Way which has helped thousands in the Army, Navy, Flying, Signal Corps and other services, as well as many thousands of home-study students.

SEND FOR FREE BOOK. Tells you how you can increase your income, multiply your opportunities and enrich your personality by speaking another language.

LINGUAPHONE INSTITUTE
95 RCA BUILDING, NEW YORK 20, N. Y.

LINGUAPHONE INSTITUTE
95 RCA Bldg., New York 20, N. Y.

Send me the FREE Linguaphone Book.

I am ☐, am not ☐ a World War II Veteran

I want to learn language.

Name

Address City

**Say You Saw
It In Popular Science**

ARTISTS MAKE MONEY

DO YOU LIKE TO DRAW?

Send name, address, age and occupation for FREE ART TEST, to find out your ability.

ART INSTRUCTION, INC.

11148 Art Instruction Bldg., Minneapolis 15, Minn.

NEW! MINIATURE DUST MASK



Wear when sanding, grinding, paint spraying, sweeping, dusting, furnace cleaning, etc. Handy as a pair of glasses. Just keep mouth closed and breathe through nose is all you do to operate. Protects against dusts, lint, coal, cement, grain dust. Has 9 sq. in. filter.

Order today.

JERRY BRYANT, Dept. PS, 919 N. Michigan Ave., Chicago 11, Ill.

Order Today \$1.00
POST PAID

ELECTRIC SHEAR SHARPENER

OVER 55,000 SOLD—IT MUST BE GOOD!

Makes an excellent Christmas gift!



Genuine Carborundum Motor driven wheel ideal for shop or home use. Send remittance with order and shipment will be made at once, prepaid to your door, complete with electrical goods catalogue.

\$9.75
complete with vise

WILLIAM MARVY COMPANY, Dept. 7
479 St. Peter Street St. Paul 2, Minn.

MENTAL
MULTIPLICATION

50¢

YOU WILL BECOME A MENTAL WIZARD

Multiply instantly. My system proven faster than computing machines. Get ahead in business. Make money through rapid advancement. Simple course a child can follow. Act today. Get MENTAL MULTIPLICATION. Only 50c postpaid.

CHARLES LIPKIN, Dept. PS1, 249 W. 34 St., New York 1



LABORATORY TECHNICIAN

BE A LABORATORY SPECIALIST; complete course. Big demand from hospitals, doctors, clinics. We teach all branches of medical laboratory work, including Medical and Dental X-Ray.

Approved by American College of

Medical Technologists

Co-educational Free Placement Bureau

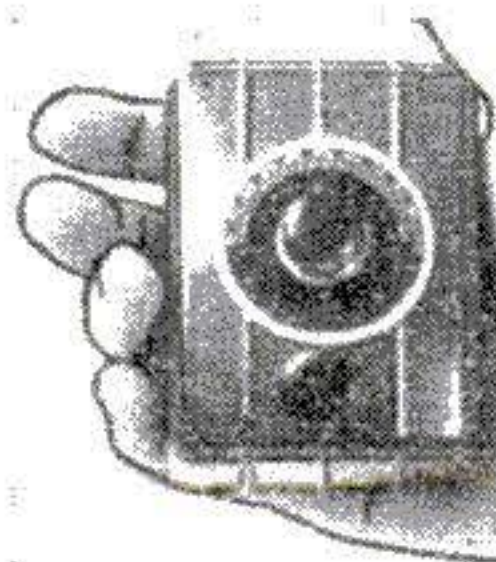
Free Catalog—Accredited for "veteran" training

CHICAGO COLLEGE OF LABORATORY TECHNIQUE
Dept. P.S. 431 S. Wabash Ave. Chicago 5, Illinois

METALS

sold in small quantities for the home workshop. Steel, Brass, Copper, Aluminum, etc. In Bars, Shapes, Tubes and Sheets. Write for free price list.

CASHMETALS CO., 2721 California Ave., Pittsburgh 12, Pa.



Poc-Kit Pal Radio

A power packed, super-sensitive one tube beginners kit includes miniature tube, factory wound loop antenna, plastic case and all parts with simple instructions. Works on pen-lite or hearing-aid cells. All parts, tube and batteries protected inside case. Astounding results. Poc-Kit Pal less phones and batteries only \$2.98 post paid. SEND \$1.00 balance COD plus fee. (FOREIGN \$4.00 U. S. Cash).

Lee Electronics Laboratory, Dept. 1-S,
17 E. 48th St., New York 17, New York

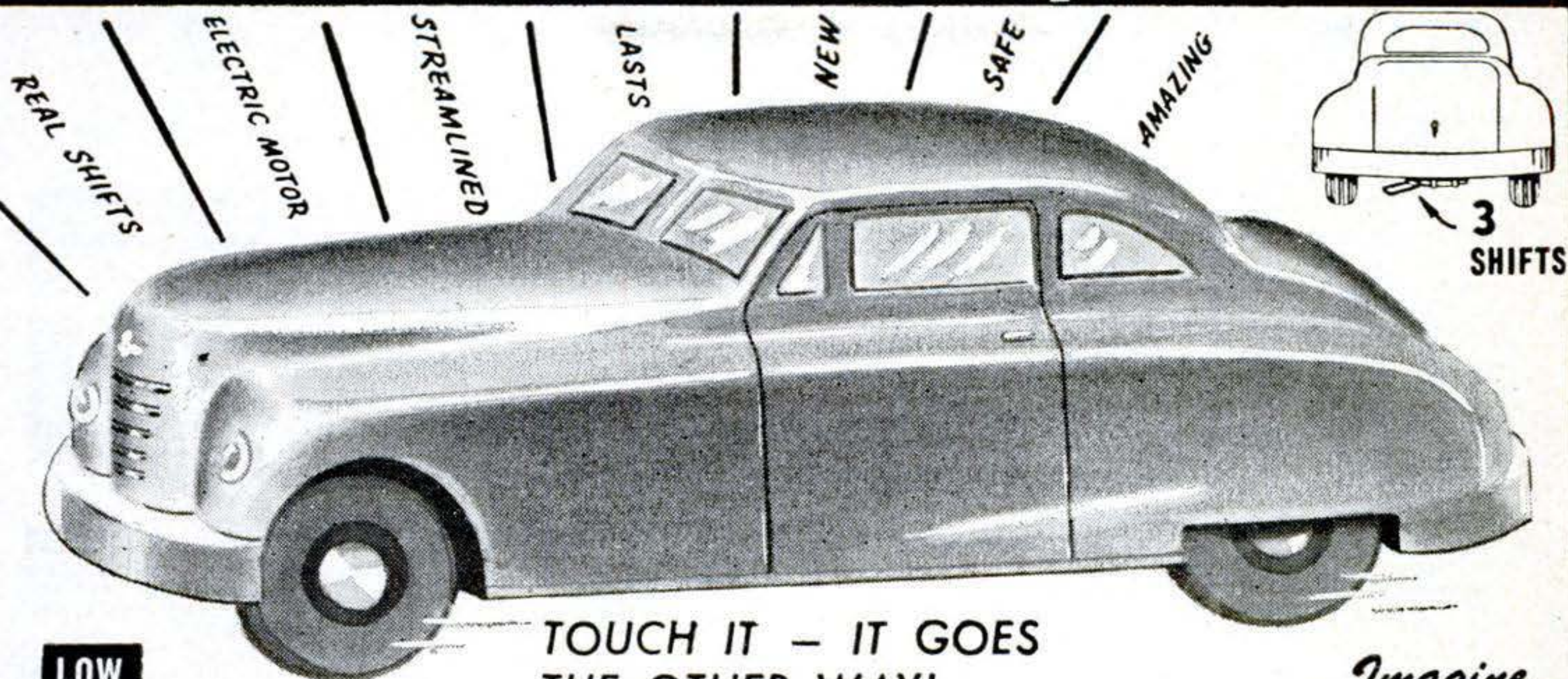
ANALYZE Handwriting

Uncrowded, fascinating field. Gratifying earnings reported by graduates in Employment, Credit, Social Service, Police and Entertainment fields. Others have developed profitable private practice, full or spare time, as Personal Problem and Vocational Counselors. Send for 3000 word TEST LESSON and Grapho Analyst FREE.

A. I. G. A. Inc., Wilholt Bldg., Dept. 126, Springfield, Mo.

FREE
BOOK
and
LESSON

LOOK! NEW 1949 ELECTROCAR with 3 real speed shifts



LOW
SECOND
HIGH
REVERSE

**TOUCH IT - IT GOES
THE OTHER WAY!**

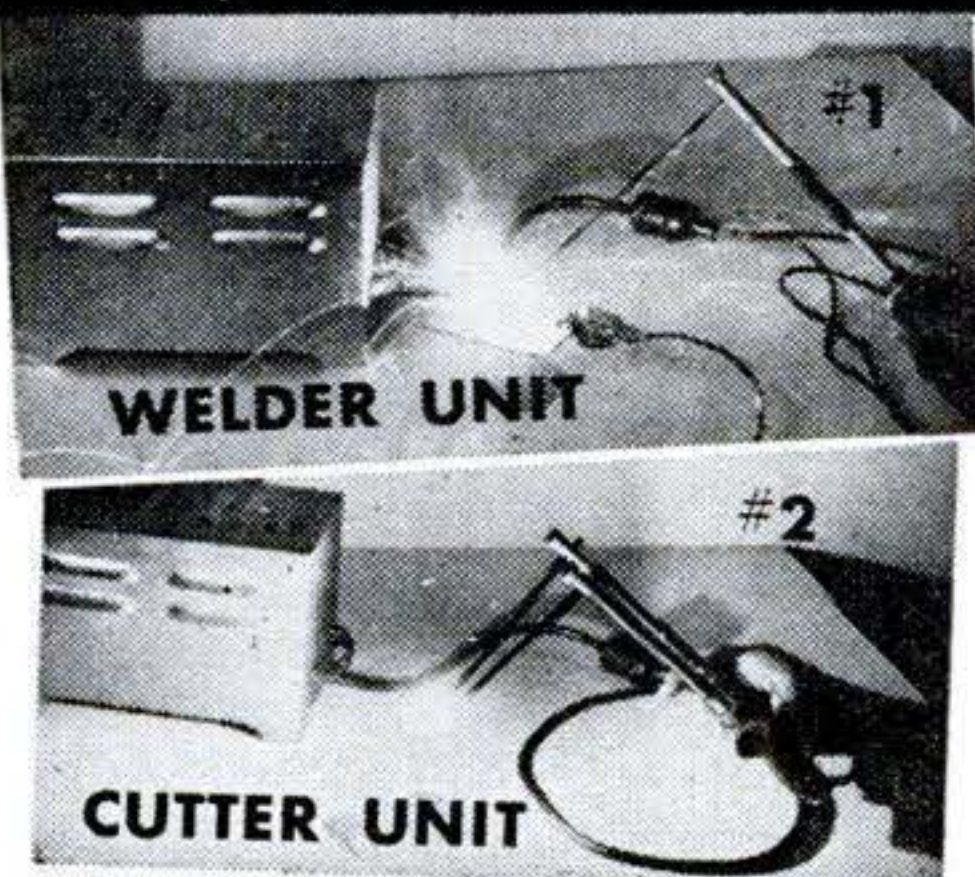
Here is the sensationally new scale-model car that captivates every child (and mommy and daddy, too.) One flick of the magic gear lever and off it goes — in low, second, high — or reverse. Runs for hours. Driven by an electric motor, powered by two flashlight batteries — safe, economical — easily replaced. Over 10 inches long — comes completely assembled with batteries, headlights, balloon-type rubber tires — in shiny red durable plastic body. Lasts forever. RUSH ORDER TODAY!

SEND NO MONEY (C.O.D. you pay postage. Remit with order, we pay postage.)

Imagine
only 2⁹⁸
Complete

ELECTROCAR CO. 59 East 8th St. N. Y. 3 Dept. P-S-3

Sensational New Electric **① WELDER ② CUTTER!**



**Uses 110-115 AC or DC • INSTRUCTIONS INCLUDED
WELD - BRAZE - CUT - MELT - SOLDER - HEAT TREAT**

The WELDRITE combination—tested and proven by countless commercial and amateur users, is now offered direct to you at the amazingly low price of only \$12.00. No Gas—No Gauges—No Spark Lighter needed. Always ready for immediate use—Just plug WELDRITE into 110-115 AC or DC outlet. Uses standard welding and brazing materials available at all welding supply stores. WELDRITE furnished complete with Converter Unit #1 Single Holder with attached Alligator clip, for welding metal up to 3/16" thickness, using up to 3/32" rod, and #2 Double Holder with Copper Coated Dual Carbon Electrodes for Cutting, Brazing, Heat Treating, Soldering, etc. Starting welding materials and instructions included.

Ideal for home workshop. Invaluable for

body and fender shops, garages, repair and machine shops, manufacturers, etc.

SEND NO MONEY! 10 DAY TRIAL OFFER
Order your WELDRITE Electric WELDER-CUTTER C.O.D. today. Pay postman \$12 plus postage charges (wt. 4 lbs.) or send \$12 and we pay postage. Either way, if not satisfied, return WELDRITE in 10 days, and money will be refunded. WELDER HOOD—Approved lens found in hoods costing to \$10—only \$3.95. California orders please add 2½% sales tax.

CALIFORNIA TECHNICAL PRODUCTS CO.

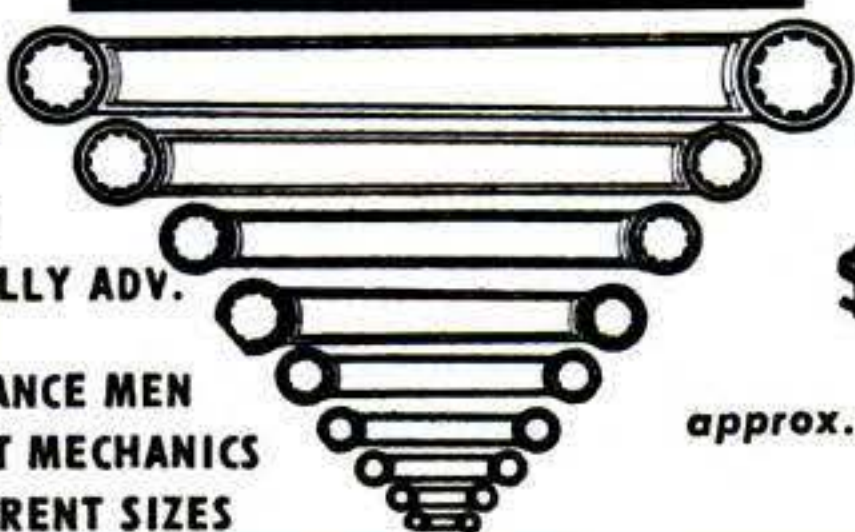
448 So. Hill St., Los Angeles 13, Calif., Dept. B-11

**BOTH only
\$12**
LOWEST PRICE
IN HISTORY!

NOTICE

ASSORTED BOX WRENCH SURPLUS

- GARAGE
- MACHINE SHOP
- FACTORY
- NATIONALLY ADV. BRANDS
- MAINTENANCE MEN
- AIRCRAFT MECHANICS
- 16 DIFFERENT SIZES



**PREPAID
ONLY**

\$9.95

approx. list \$23.00

SAVE up to \$14.00

9 WRENCHES
smallest 3/8", largest 1½"

Mail Orders Promptly Filled — Mailed C. O. D. and Parcel Post

Send
Check or M.O.

REGIONAL ENGINEERING & SUPPLY COMPANY
Dept. P-1, 7511 Myrtle Ave., Glendale 27, N. Y.

NOTICE

A Better Way TO BUY LIFE INSURANCE

Newly developed Policy Selector enables you to quickly determine the best life insurance policy for your particular needs. Shows you how to buy it right. Enables you to get more protection for your insurance dollar.

SENT FREE The Service "SELECT-A-POLICY" insurance planner is yours for the asking. No cost. No obligation. Sent BY MAIL! No agent will call. Just write—

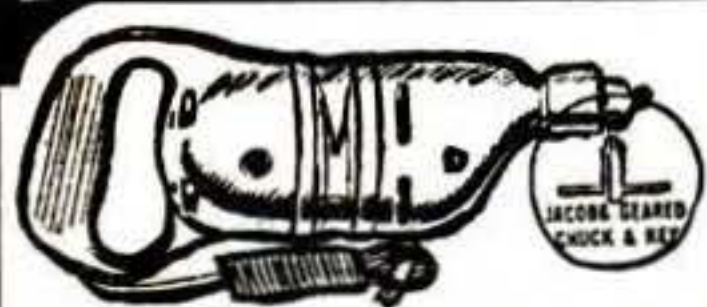
The SERVICE LIFE INSURANCE CO. Omaha 2, Nebr.



**Write For
FREE "POLICY
SELECTOR"**

644 Service Life Bldg

MAIL ORDER **GENUINE U.S. GOVT. WAR SURPLUS** Sale



POWERFUL ELECTRIC DRILL
Nationally Advertised 1/4" Drill at Less Than Established Price
Equipped with 1/4" Jacobs geared chuck and key. A full size rugged shop tool. Convenient handle type switch, perfect balance. Powerful 110 volt AC-DC motor, will not stall under heaviest pressure. Multiple ball thrust bearing made for tough continuous service in shop or field. Perpetual factory guarantee assures you of a lifetime of trouble free use. We refund your money (less transportation charges) if not pleased with drill after \$19.95 trial.

Camper's Special
Mess kit, mess kit cover, canteen cups, silverware (knife, fork and spoon), Army used, but perfect. **98c**

HEAVY DUTY MEN'S KNEE BOOTS
Black Rubber with Sturdy Molded Sole and Heel
Non-slip tread, rocker bottom for easy walking. Sizes from 6 through 12. **\$4.19**

FLIGHT JACKETS
Army Air Corps B-15 "type" Flight Jacket. Sturdy water repellent olive drab poplin. Flannel lined sleeves, pile lined chest and back. Zipper front, 2 slashed pockets, mouton collar. Knitted cuffs and waist for extra protection. Warm and good looking. Sizes 34 to 46. Price only **\$10.98**

Above prices do not include postage. Order now by mail. Send for Bargain Lists on Radio, Clothing, Camp and Hunting Equipment.

SOCKET WRENCH SET
1/2" and 1/4" HEX DRIVE
18 PIECES
Complete range of 14 Socket Wrenches 3/16" to 15/16". Two Offset Handles. Ratchet Wrench and Plug Adaptor - Bright Plated Tools in Heavy Metal. Box 3x7x1 1/4" **\$2.95**

TCX-52 Marvel Schebler Carburetor
Can be Used on Gasoline Engines Up to 20 H.P.
1 1/2" Venturi throat-13/16" throttle opening. Main nozzle .08" ID. Bronze body, brass float chamber, 1/8" IPT gas inlet, needle valve. Mounting studs 1-13/16" between centers. Sturdily built. Export packed. **\$2.95**

MECHANIC'S TOOL ROLL
Protects Your Tools and Parts from Dirt and Loss
Opens up into 19 convenient pockets, six of which have snap covers. Sturdy, durable waterproof canvas. Leather ties. 27"x27" unrolled. **59c**

Flexible Pouring Spout
For G.I. Blitz cans or 55 gal. drums. New. **98c**

ABELL DISTRIBUTING CO.
Dept. 21
4633 York Rd. Baltimore 12, Md.

McCURLEY'S **NEON** UNIT **FLUORESCENT** Easy TO SELL EVERYWHERE TO INSTALL ANYWHERE

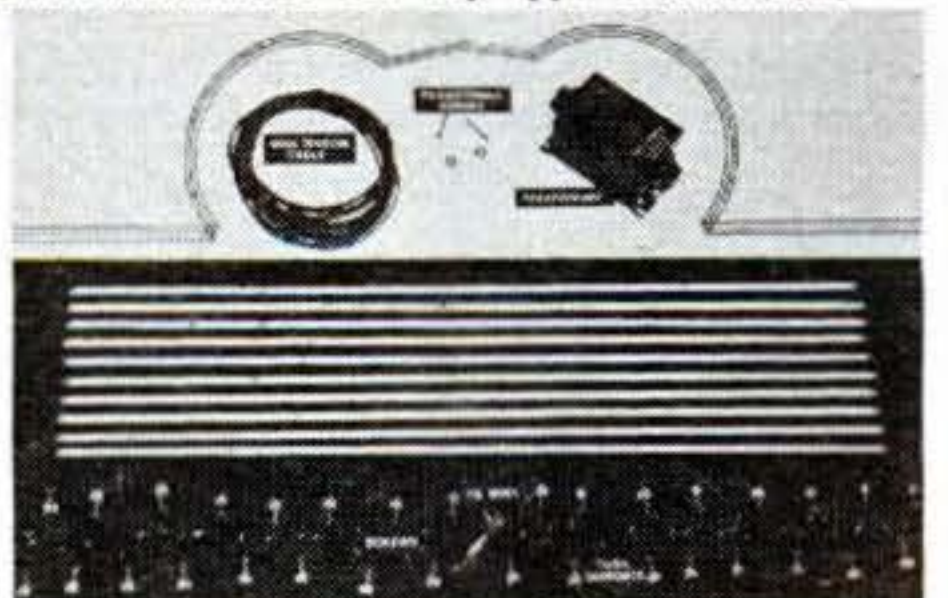
10 SEPARATE 5-FOOT LENGTHS ALL TOP QUALITY FLUORESCENT NEON TUBING—CHOICE 6 COLORS

- 10 Separate 5-foot lengths of ALL TOP QUALITY fluorescent NEON TUBING—your choice of any combination of colors—RED, GREEN, BLUE, ROSE, GOLD and WHITE. All new tubing, full length, pumped, sealed and tested before shipping.
- 50 feet high tension cable. All new top quality.
- 1 large transformer. Guaranteed top quality, new, not rebuilt.
- 32 tube supports. All top quality.
- 45 lengths of copper wire. New, top quality.
- 36 cadmium plated screws for attaching wire and tubing. Top quality.
- 2 large screws for transformer attachment. New top quality.
- 1 set of simple diagram instructions for any type installation.

ITEMS 4, 5, and 6 sacola, Florida. SHIP- ing the unit. Extras are included as protection to you in case of loss.

TERMS: F.O.B. Pensacola, Florida. SHIP- PING WEIGHT: 75 lbs. \$16.65 Cash with order for each unit, Balance C.O.D. 2% discount for all cash with order.

1 or 100 UNITS READY FOR IMMEDIATE SHIPMENT.



ORDER BLANK

T. D. McCURLEY
409 Fifth Street, Pensacola, Fla. Date:.....
Send me immediately.....50 FOOT NEON UNIT COMPLETE
No. Units
I enclose herewith \$16.65 () CHECK OR () MONEY ORDER as deposit for each unit ordered, and I will pay the balance of \$38.35 for each unit C.O.D.
CHECK NO. UNITS..... SPECIFY COLORS: ROSE RED GOLD BLUE WHITE GREEN.
SHIP BY () Express—F.O.B. Pensacola, Fla.
() Freight—F.O.B. Pensacola, Fla.
BE SURE THAT YOUR NAME AND ADDRESS IS CORRECTLY GIVEN
Address.....
Name.....
City.....Zone.....State.....

WOODWORKERS ...Get this CONSTANTINE MASTER MANUAL

Get the Most Fun From Your Hobby
Indispensable to woodworkers. Newest, biggest edition, more pages, more color, helpful how-to-do-it articles, pre-war and new items, more bargains. Send 25c today and we will include **FREE! FULL YRS. SUBSCRIPTION** to Chips and Chats, published bi-monthly. Keeps you up-to-date on everything in woodworking, offers big money-saving bargains. Send now.

ALBERT CONSTANTINE & SON, Inc.
793-G 135th Street, New York 54, N. Y.



HOW TO CUT RAFTERS

New vest pocket book gives lengths, side cuts, plumb cuts, deductions. For all rafters for any building from one inch to forty feet wide. Gives numbers to cut on square. Also degrees for same cuts for Radial Saws. All standard pitches from 1/8 to 5/8. Just open book to pitch page and there are your lengths, side cuts, etc. Anyone who knows what a jack rafter is can frame a roof if he has this great book. Price \$1.50, (\$2.00 in Canada). **Builders' Topics, Dept. S, Lock Box 828, Seattle, Washington. CARPENTERS, PLUMBERS, PLASTERERS, ELECTRICIANS, ETC.** subscribe for Builders' Topics, the monthly magazine for HE-MAN CONSTRUCTION WORKERS. Only \$1.50 per year, (In Canada—\$2.00). Sample copies 25c.



SHEEPSKIN LEATHER JACKET

Navy J4 Flying Type—Sizes 36-46—Converted
Now you can get a WELL TAILORED, LONGER LASTING, WARM jacket at minimum cost because you are buying direct from the Manufacturer. Special Features: Length 27", Mouton Collar, By-swing Sleeve, Heavy-duty Talon Zipper, Double Lined Leather Cuffs and Wristlets, Extra Leather on Top Sleeve. Buy this jacket now! Money Back Guarantee. **\$18.95.** Prepaid orders shipped postage free. C.O.D. orders—you pay postage.
Renovate Your Jacket—Lengthen the life of your leather jackets at manufacturer's wholesale rates. Send for FREE descriptive circular and price list today.
BERLEW MFG. CO., INC., Dept. S, Merrick, New York

Say You Saw It In Popular Science

BEST TIRES FOR LESS	
Very slightly used, high original tread, first line tires. Grade AA 1. 34 years of fair dealing stands back of every transaction.	Passenger Tires
600/16	\$5.58
650/15	\$5.28
650/16	\$5.58
700/15	\$5.58
750/16	\$5.58
550/17	\$5.48
Truck Tire Bargains	
900/16	\$8.48
650/20	\$9.48
700/20	\$11.58
750/20	\$11.58
825/20	\$13.98
900/20	\$14.98
1000/20	\$15.98
1100/20	\$16.98
32/6 (8)	\$10.98
32/6 (10)	\$12.98
750/20 Mil.	\$12.98
900/16 Mil.	\$11.58
900/16 Mil.	\$11.58

Mail orders rushed send check or money order. Thousands of satisfied customers.
VILL TIRE CO., Dept. PS
805 N. Broad St., Phila. 23.



BALANCED HOLE CUTTER

Fits any 1/4" twist drill.
Two standard 1/4" lathe bit blades cut up to 3" hole. Completely adjustable with Allen key.

Postpaid complete **\$465**
Send money order or check to:
CADDO CO. Box 1200 Wichita 1, Kansas

A Perfect Gift FOR KIDS YOUNG and OLD 4 SPEED MOTORS



ONLY **\$7.95**
Californians Please Add 20c For Sales Tax

PLUS \$1.00 FOR PACKING AND SHIPPING
Approximately 11 inches Long
1/20th HORSEPOWER 115 VOLT 50/60 CYCLE AC MOTORS with integral gear box having four 1/4 inch drive shafts turning simultaneously at the following speeds:
4000 RPM—For grinders, buffers, small drills, etc.
1500 RPM—For wrapping fishing rods, slow speed tools.
250 RPM—For developing tray rocker for photographic darkroom.
5 RPM—For turning barbecue spits, advertising displays.
A THOUSAND OTHER USES AROUND THE WORKSHOP
Money Back Guarantee. Pulleys, Mandrels, Belts, etc. Available.
TROUP ENGINEERING CO.
2223 GRAND AVE. LONG BEACH 4, CALIF.

VETERANS Learn WATCHMAKING

**JEWELRY
ENGRAVING**

**Trades with
Greater Security**

Above Average Pay

No Age or Physical
Limitation

In One of the Most Highly
Respected Careers

Trained Men Always in
Demand

Learn by our Advanced Train-
ing Method . . . Only Latest
Scientific Equipment and
Facilities.

Write Today for Complete
Information and Catalog



KANSAS CITY SCHOOL OF WATCHMAKING

America's Most Progressive Horological School
619 WYANDOTTE ST. KANSAS CITY 6, MO.

"MAKES ARITHMETIC INTERESTING"

NEW ABACUS of beautiful aluminum, the fastest and handiest little adding machine ever invented! Guaranteed to save time and money in any business. Ideal for children to learn arithmetic like a game. With illustrated instructions. \$3.50. Larger model: add, subtract, multiply, divide, extract square root with equal ease. With complete illustrated instructions. \$6.50. Send for FREE lesson & details. Discounts to schools.

EXCLUSIVE DEALERS WANTED

LOY'S CHINESE CALCULATOR, Dept. 86S
1317 R.I. Ave., N.E. Washington 18, D. C.



ILLUSTRATED COMIC BOOKLETS

THE KIND MEN LIKE!
(VEST POCKET SIZE)

They are loaded with rare car-
toons. Full of Fun and Humor.
20 DIFFERENT booklets
sent prepaid for \$1 in plain
sealed wrapper. No C.O.D.'s.

GRAYKO, Dept. 1505, Box 520, G.P.O., N.Y.C. 1

Trained Men Get the Better Jobs
in the Automotive Industry

PRACTICAL SHOP TRAINING
in AUTOMOTIVE MECHANICS
BODY and FENDER REBUILDING

If interested write or wire

**ATLANTA MOTIVE TRADES
INSTITUTE** Dept. C, 254 IVY St., N.E.
Atlanta, Georgia

Member of the Southern Association of Private Trade Schools

Veterans ask about G I Training

THE GREATEST
THING

IN
PLASTICS!

PLASTICAST



A NEW HOME INDUSTRY AND HOBBY!

PLASTICAST is a transparent liquid plastic; can be poured into ANY kind of mold or container. Hardens in a few minutes into a transparent solid, clear-as-glass, tough as steel plastic! No tools, machinery or skill required. IDEAL for imbedding pretty flowers, butterflies, photos, medals, souvenirs, biological specimens, etc. Makes a **PERMANENT and ATTRACTIVE** display. Make attractive jewelry, gems, lenses, knick-knacks, novelties. Easily cast into sheets, rods, blocks, ANY color, ANY shape! **EVERYTHING** furnished, including molds, for making about \$50.00 worth of unusual novelties! **PLASTICAST OUTFIT, Complete with 3 molds \$3.50**

**PLASTIC CAST OUTFIT MAKE UNFORGETTABLE TREAS-
URED CHRISTMAS GIFT! WE WILL ENCLOSE YOUR CARD**

PLASTIDUR . . . (LIQUID IVORY). Ideal for casting all OPAQUE articles. Hardens in a few minutes into an extremely hard IVORY-like plastic! May be dyed any color or cast into any shape. Works in **EVERY** type of mold! Non-inflammable, waterproof. DURable. Ideal for statuary, novelties, figurines, toys, gadgets, tools, knobs, bases . . . a million useful applications! Outfit comes complete with molds, dyes, accessories, instructions, etc. for making about \$100.00 worth of attractive jewelry, etc! **\$5.00**

Our Casting Plastics are as easy to use as pouring water out of a glass!

TERMS: We pay the postage (U.S.A. & Canada only) if full cash accompanies your order, C.O.D. accepted (U.S.A. only) if \$1.00 deposit is included for each item ordered. C.O.D. orders not postpaid.

FREE

A very attractive and useful novelty made with one of our plastics given absolutely free with every one of our catalogs! Catalog lists many new materials for making **MOLDS and CASTINGS** with Liquid Plastics, Liquid Marble, Latex, Elastex, Castwood, Wax, Metals, Plaster, Shellcraft, Internal Carving, Molds, Moulage, etc. Price of catalog only 10c.

DEALERS: WRITE FOR ATTRACTIVE WHOLESALE PRICE LISTS
PLASTICAST CO. (Dept. A)

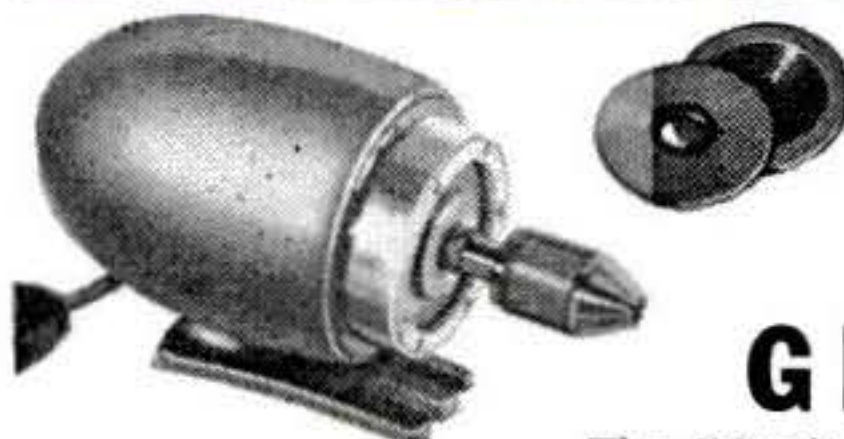
5961 Madison St. Chicago 44, Illinois (Order by mail only) P. O. Box 987 Palo Alto, Calif.

LEARN TO WRITE

a Good Hand!

FOR BUSINESS AND SOCIAL SUCCESS!

Improve your handwriting at home quickly with my new instruction books just off the press. Master all the secrets of better penmanship. Simple and easy, fully illustrated, highly endorsed. Begin today. Write for: ☐ **New Free Book**, "How to Become a Good Penman", or check books wanted, \$1.00 each. ☐ Business Writing ☐ Artistic Writing ☐ Card Writing ☐ Engrossing Alphabets ☐ Bird and Design Flourishing ☐ Complete Set \$4.50 ☐ Enclose 10c for your name beautifully written and shading penpoint. S. A. Ziller, President, **TAMBLYN SCHOOL OF PENMANSHIP** 439 Ridge Bldg. In Business Over 52 Years Kansas City, Mo., U.S.A.



Craft Pal Combination DRILL- GRINDERS

only

\$8.95
Complete
F.O.B.
Chicago

Complete with
**MOTOR
CHUCK**

**SET OF 3 GRIND-
ING WHEELS**
4"x1/8"x1/2"
STEEL WASHERS
LOCK PIN

The "Craft Pal" is a Combination Drill and Grinder, complete with full equipment. Home Craftsmen, Hobbyists, Small Shop Owners will find "Craft Pal" indispensable. 30 second change-over from drill to grinder.

Large 4-inch Grinding Wheel is suitable for every light-duty grinding purpose. Chuck takes up to 1/4-inch bit. Every home work-shop will find the handy Power Drill useful for most drilling requirements.

Motor features the following: Aluminum housing, full ball-bearing, hammered tone blue, cool-running, 1/20 horsepower, 60 cycles, 110 volts A.C., 3500 RPM, convenient on-and-off finger-control switch.

ORDER TODAY—SEND CHECK OR M.O.

GROBAN SUPPLY CO. 1522 So. Michigan Avenue
Dept. PS-3 Chicago 5, Ill.

\$1 Will Solve Your Gift Problems

GADGET-OF-THE-MONTH CLUB WILL FILL ALL YOUR NEEDS

The most unusual club in the world, the Gadget of the Month Club, is ready to act as Santa Claus for you and solve all your wearisome gift shopping problems. There is nothing which will bring more joy and sheer pleasure, to both giver and recipient, than an intriguing Gadget-of-the-Month Club membership. Memberships are designed for both men and women. Here's a chance to be remembered all year 'round as the giver of the most unusual and practical gift of the year!

MEN GET

Men receive sturdy, practical gadgets which they will prize. All are designed to answer a man's need for something he has wanted. Generally, his gifts will lean toward the mechanical or business side. At any rate, you can bet he'll be happy with a membership in the Gadget-of-the-Month Club.

WOMEN GET

Women receive useful, colorful and practical gadgets which they can use around the house, or perhaps on their person. Some gadgets have been unique household tools which have miraculously solved culinary headaches. Women are among the most enthusiastic members of Gadget-of-the-Month Club.

TWO TYPES OF MEMBERSHIPS ARE AVAILABLE

Annual membership costs only \$5. and brings the new member a unique, different, never-before-marketed, unusual gadget once a month for the entire year! Members get actual samples of selected gadgets before the public sees them. Trial memberships, costing only \$1., are available to anyone, and bring the member six new exclusive gadgets, one a month for six consecutive months. This choice of membership will enable you to fill all your gift problems, even to your favorite aunt who doesn't like new fangled devices. Send her a trial membership, and she'll be your friend for life.

THOUSANDS HAVE JOINED CLUB

Altho the Gadget-of-the-Month Club is only little more than a year old more than 100,000 persons have joined. Renewal memberships are pouring in from those who took the trial subscription. The fabulous success story of the club has been told the world over in radio, news and feature stories in hundreds of newspapers and in magazines such as Coronet and Popular Science Monthly.

THIS PARAGRAPH—LADIES ONLY

If you're reading hubby's favorite magazine while he's stoking the furnace, don't forget to get the address on this advertisement. Remember—there is nothing you can give him for more fun during the coming year than a membership in the Gadget-of-the-Month Club. It will also solve some of your Christmas shopping problems to give memberships to your friends, too.

GUARANTEE

The total retail price of the six gadgets you will receive must be far greater than the cost of your membership or **your money will be cheerfully refunded.**

ORDERS WILL BE FILLED IN TIME

We faithfully promise that gift announcement cards bearing the name of the donor will be mailed in time to reach persons within the U.S.A. in time for Christmas if orders for memberships reach us prior to Dec. 21st. We may have to send them air mail, but we'll get them out on time! However, to help us do a better job, send in your list of gift memberships today.

GADGET-OF-THE-MONTH CLUB, INC.

P. O. Box 2000, Los Angeles 54, California

☐ Please send memberships to the attached gift list as indicated, and bearing an appropriate card with my name as donor.

Enroll me for ☐ \$1. trial mem. ☐ \$5. year's mem.

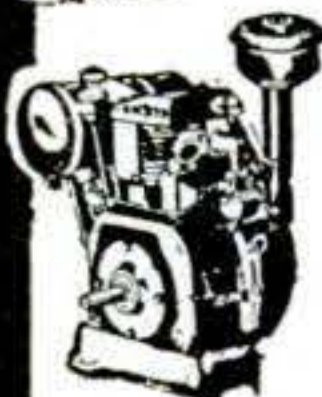
Name.....

Street.....

City.....

Occupation..... Age.....

**WAR
SURPLUS
BARGAINS**



Outstanding MECHANICAL, ELECTRONIC Buys

● Power Plants. Nearly new and perfect. 110-volt, 60-cycle, 25000-watt units. Well known make. Fine for farm, cabin, etc.
Original Cost \$535.00 Sale \$229.80

● Gas Engines. Nearly new and perfect. Briggs ZZ 6.5 h.p. Useful tractor, elevators, pumps, scooters, buzz saws, etc. A real value.
Original Cost \$140.00 Sale \$86.90

● Rotary Gear Pump. New. High vacuum and pressure. Hundreds of uses. 1/2 inch drive shaft.
Original Cost \$38.65 Sale \$3.95

● A-C Motor. New. Reduction gear with four shafts. Speeds of 8, 32, 320 and 4000 r.p.m. Useful buffers, grinders, drills, etc. 110-volt, 60-cycle. An experimental wonder.
Original Cost \$38.75 Sale \$8.75

● Electrical Room Heater. New 110-volt, 60-cycle, 1600-watts. Latest Chromalox highly efficient elements. A top flight heater.
Original Cost \$29.60 Sale \$12.80

● Electrical-Electronic experimental kit. Permits hundreds of experiments. Eaves-dropping, private telephone, electrical theory, radio set, burglar alarm, etc., etc. Ideal for boys Xmas present. Full instructions. Educational—fascinating—scientific.
Parts cost \$15.00 Sale \$4.77

We pay all freight and postage charges in the U.S.A. Order direct from ad or send for catalog giving full description of our many bargains. We accept personal checks. Our references—NATIONAL BANK OF COMMERCE.

LECO ENGINEERING CO.

Box 908-PS-11

Lincoln, Nebr.

for the newest in

RADIO AND TELEVISION

FREE

1949 NEWARK CATALOG

a value-packed listing of more than 20,000 standard brand items including

- Radio kits for beginners and professionals
- Television components and kits for hobbyists
- Electronic and laboratory test equipment
- Sound systems
- Technical literature

IF IT'S IN RADIO & TELEVISION...NEWARK HAS IT!
ONE YEAR TO PAY WHILE USING EQUIPMENT

3 GREAT STORES

at 115 West 45th Street, and
212 Fulton Street, **NEW YORK**
323 West Madison St., **CHICAGO**

MAIL ORDER DIVISIONS

242 W. 55 St., N. Y. 19, N. Y.
323 W. Madison St., Chi. 6, Ill.

24-hr. mail-order service

MAIL COUPON TODAY



Newark Electric Co., Dept. 16
242 W. 55th St., N. Y. 19

Please send me **FREE** the Newark 1949 Catalog

MY NAME _____

ADDRESS _____ CITY _____ STATE _____

\$350

IN A SINGLE WEEK

GROSS

IN MY OWN BUSINESS



Some Make More, Some Less . . .
Start This Business for **YOUR OWN**

FREE BOOK! MAIL COUPON

VON SCHRADER MFG. CO.

B83, Racine, Wisconsin

Send at once (no obligation) your FREE booklet containing information about your Electric Upholstery Cleaner and how I can own my own permanent, profitable business.

Name _____

Address _____

City _____ Zone _____ State _____



George Held earned \$350 in one week with

ELECTRIC UPHOLSTERY CLEANER

• Here's YOUR chance to start a money-making, year-'round business of your own and make the success you've dreamed about. R. O. Donnley took in \$40 in seven hours. O. W. Ware landed a \$750 hotel job and made a fine profit. J. S. Corbit grossed \$279.50 his first month. P. D. Ash cleaned 23 auto seats at \$5 each in one week. And so it goes. Homes, hotels, offices, clubs, all places where furniture is used, offer you big profit possibilities. Auto seats and interiors, also.

NO SHOP OR OFFICE NECESSARY
You clean furniture on customers' premises. No hauling costs. No high rents. Supplies are in-

expensive and you operate, at low cost, from your home. What you take in is mostly profit. Surely YOU will want to investigate an opportunity like that—right away. Own your own business. Be your own boss. If you are ambitious, honest and courteous, we will help you to start and succeed.

FULL INFORMATION FREE

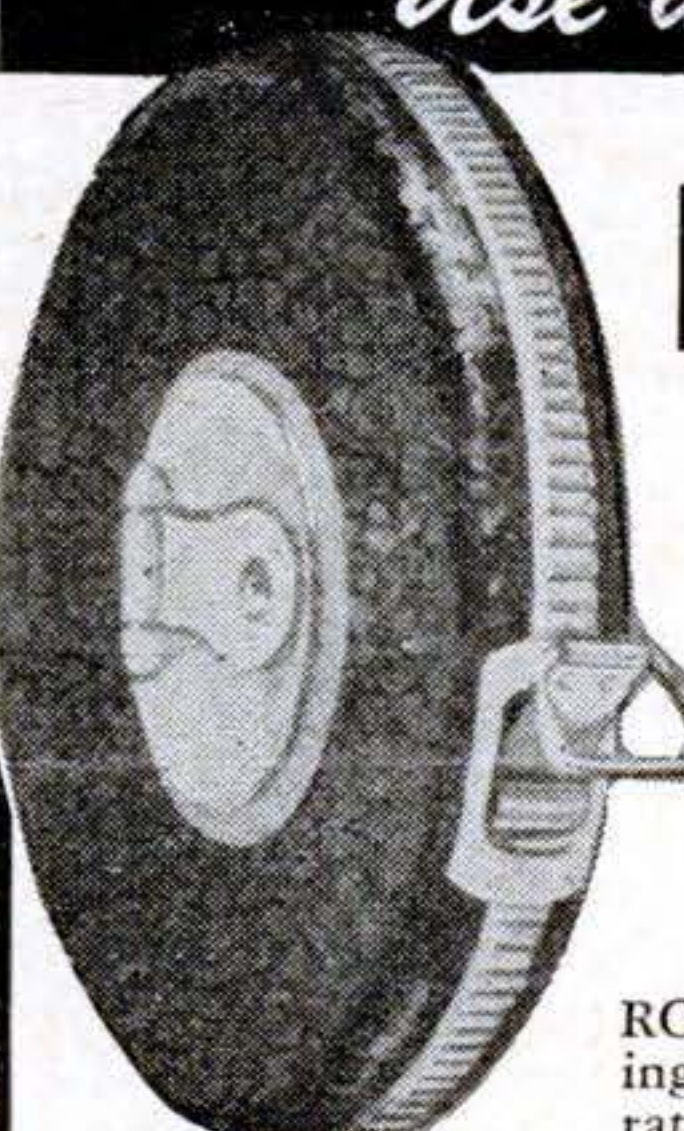
MAIL COUPON TODAY

Send the coupon or write for Furniture Cleaner Booklet. It tells all about this electric cleaner—how to start YOUR business—how to make a profitable success. Don't delay. It's your BIG opportunity.

MAIL COUPON TO

VON SCHRADER MFG. CO., B83, RACINE, WIS.

Use a Roe Tape



NOTICE !

• CARPENTERS • MECHANICS

• ELECTRICIANS • ARCHITECTS

• CONTRACTORS • BUILDERS

• SUPERINTENDENTS

• POLICE DEPTS.

• INSURANCE INVESTIGATORS

• SHIP WRIGHTS

• BRIDGE BUILDERS

• ATHLETIC INSTRUCTORS; etc.

ROE Tapes make your measuring work simple, easy and accurate. They feature extra smooth operation and all figures are clear and legible. A ROE Tape is a fine tape. It is built to last and to serve you faithfully.

Special ROE Features Are

• heavy cast winding mechanism.

• durable black leatherette casing fitted with "Monel" metal band.

• ridged for easy gripping.

• will not bend or break.

• all exterior metal surfaces "Rust-proof"

• guaranteed against material defects.

This model 50 ft. \$5.25. Accept no substitute for a ROE Tape. Ask your dealer. If temporarily unavailable locally write us direct giving name of your dealer. A few selected dealerships still open.

Justus Roe & Sons

PATCHOGUE (Established 1876) NEW YORK

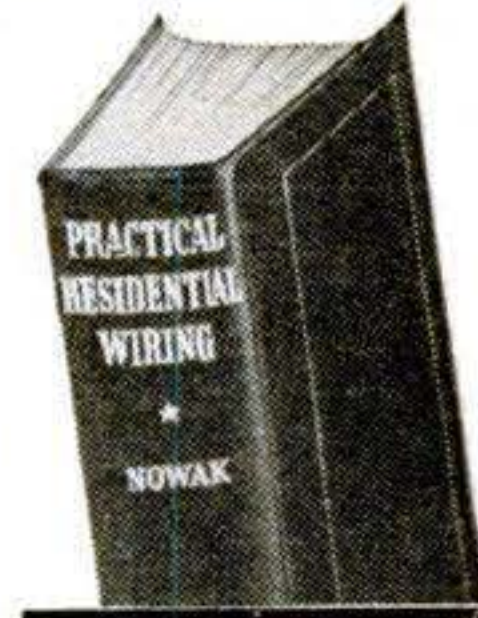
SAVE MONEY

on Costly Electrical Jobs

PRACTICAL RESIDENTIAL WIRING

by John F. Nowak

Instructor, Electrical Installation and Practice—Teacher Trainer, New York City



Here at last is a truly authoritative book that tells you everything you need to know in order to do your own electrical work, from the smallest repairs to the largest installations. It begins by showing you how to read and draw electrical diagrams, starting with the simplest of all problems, the wiring of a single light, and proceeding step-by-step through every type of installation up to the layout of an entire home. Then the author shows you exactly how to do the actual work. He furnishes hundreds of hands-at-work photographs, with full explanations, on the use of all the tools in carrying out and testing every operation. The National Electrical Code is clearly applied at each crucial point, insuring that everything you do fulfills Code requirements. See for yourself how completely this book covers every detail of planning and installation, repair and maintenance of any house wiring system. Mail the coupon today, for a free 10-day examination of this great book!

MAIL THIS COUPON

D. Van Nostrand Company, Inc.

250 Fourth Avenue, N. Y. 3, N. Y.

Please send me "Practical Residential Wiring" on approval. Within 10 days I will either return the book without obligation or send you \$1.95, plus a few cents postage, and \$2.00 per month for 2 months thereafter. (If you send the entire amount of \$5.95 with this coupon, we will pay the postage. Same return privilege and refund guarantee.)

Name

Address

City Zone State

NOVEMBER 1948 57

Copyrighted material

HOW I STEPPED *into a* Big Pay HOTEL JOB!



Louis C. Schmitz, Driver-Salesman, Now Assistant Manager, Although He Knew Nothing About Hotel Work

"I was a driver-salesman. My earnings were fairly satisfactory but I wasn't happy. So I enrolled for Lewis Training. Before graduating, I secured a good position. Less than five months later I became Assistant Manager. My salary has been substantially increased and I confidently look forward to the future."

HOTELS NEED TRAINED MEN AND WOMEN

Thousands of Lewis-trained men and women winning success and a sound, substantial future in the colorful hotel, club and institutional field. They are making good as Managers, Assistant Managers, Stewards, Hostesses, Executive Housekeepers and in 55 other types of well-paid positions. Not only has this fascinating business been breaking records, but authorities agree the greatest travel boom in history is now under way. The demand for trained men and women, therefore, will be greater than ever.

Previous experience proved unnecessary in this business where you are not dropped because you are over 40. Good grade school education, plus Lewis Training qualifies you at home, in spare time. Write your name and address in the margin and mail this ad TODAY for Free Book which tells how you are registered free of extra cost in Lewis National Placement Service.

Course approved for Veterans' Training

☐ Check here if you are a veteran.

Lewis Hotel Training School **33rd** **SUCCESSFUL YEAR**
Room NW-2785 Washington 7, D. C.

GET INTO DIESEL-AUTO MECHANICS MASTER ALL PHASES

Shop Method HOME TRAINING by an Established Resident School prepares you for MANY GOOD JOBS!

Get COMPLETE Training

Diesel-Automotive Industry needs trained men, to install, maintain and repair all types Diesel and Automotive engines—AND allied equipment. Now, National Schools offers you practical, proved home study training covering ALL phases. Basic instruction and specialization in field of your choice. All-embracing instruction. Valuable, large engine manual—TOOLS and EQUIPMENT included. Earn while you learn. INVESTIGATE—get full information.

Big Book and Sample Lesson FREE

You Receive Tools and Equipment as Part of Your Course.

Approved for VETERANS

NATIONAL SCHOOLS

LOS ANGELES 37, CALIF. • EST. 1905



FIND OUT NOW...MAIL COUPON TODAY

NATIONAL SCHOOLS, Dept. PSD-11 (Mail in envelope or paste on penny postcard)
4000 South Figueroa Street
Los Angeles 37, California

Mail me FREE the book, YOUR FUTURE IN DIESEL, together with the Sample Lesson. I understand I may keep and use the information with no obligation.

Name.....Age.....

Address.....

City.....Zone.....State.....

Check here if Veteran of World War II

"Radio For The Millions" shows:— HOW TO BUILD 78 RADIOS— PHONOGRAPHS—OTHER SETS!

The giant book, *Radio For The Millions* tells you how to build 78 radios and phonographs! Imagine! 192 pages, 648 pictures on building an 8-tube FM set, a 2-way radio station, bicycle radio, floor lamp set, vest pocket portable, midget AC-DC set, superhet, high-fidelity amplifier, all-wave receiver, home recorder, etc. Plus full details on "trouble-shooting" and handsome cabinet suggestions! So order now—send no money! When book arrives, pay postman only \$1.98 plus postal charges for handsome Deluxe edition. If after 7 days' free trial you aren't delighted, return it for full refund. Mail your order right away to:—

POPULAR SCIENCE, Dept. 118B, 353 4th. Ave., N. Y. 10, N. Y.

DADO HEADS Special Price—30% OFF Dandy Christmas Gifts

Every saw owner wants one for cutting grooves, rabbets, etc. Built by leading tool maker from finest alloy steel. Complete head with 2 outside blades and 1 chipper. Specify 12" or 58" bore. Amazing bargain. Order now: quantity limited.

No.	Diam.	Outside Blade	Max. Width of Cut	Postpaid
2	5 1/2"	Cloverleaf-type	9" 16"	\$5.95 ea.
3	5 1/2"	Solid-type	9" 16"	6.95 ea.
4	6"	Cloverleaf-type	13" 16"	8.95 ea.

Money-Back Guarantee—Send check or money-order, no C.O.D.'s.

SUPERIOR DIST. CO., P.O. Box 212, Schoolcraft, Michigan

Wonders Through The Microscope

A new book which tells you all about MICROSCOPY. Turn an inexpensive microscope on hundreds of specimens within a stone's throw of your front door and you step off into a new world of wonders. Complete Manual for amateurs. How to use equipment, secure and preserve specimens, take photomicrographs, etc. Numerous illustrations. DeLuxe edition, \$1.49.

POPULAR SCIENCE Dept. 118B

353 Fourth Ave.

New York 10, N. Y.

100 POWER TELESCOPE



Designed for serious astronomical study. 2 3/8" objective, hand corrected to astronomical quality. Body tube 31" long finished in black aluminite and chromium plate. Special mounting will fit any standard camera tripod. Price \$65.00. Tripod extra. Free literature. Catalog 10c.

JANAN INSTRUMENT CO.

76 INTERHAVEN AVENUE, PLAINFIELD, N. J.

"YOU ARE UNDER ARREST!"



Help Bring Crooks to Justice Through Scientific CRIME DETECTION!

We have taught thousands this exciting, profitable, pleasant profession. Let us teach you in your own home. Learn Finger Printing, Firearms Identification, Police Photography, Secret Service Methods thoroughly, quickly, at small cost. Over 800 of all American Bureaus of Identification employ I. A. S. students or graduates. We can prepare you for this fascinating work during spare time. Write today, stating age, for "Blue Book of Crime."

INSTITUTE OF APPLIED SCIENCE, 1920 Sunnyside Ave., Dept. 1368, Chicago 40, Ill.

PRECISION MICROMETERS

WAR SURPLUS ALL NEW! STANDARD BRANDS MANUFACTURED TO GOVERNMENT SPECIFICATIONS

- No. 901 Reed Micrometer 0" to 1". Black C metal frame with ten thousandths calibrations. Decimal equivalents on the thimble \$4.50
- No. 802 Reed Micrometer, as above, 1" to 2" 5.75
- No. 806 Reed Micrometer, as above, 5" to 6" 6.75
- Goodell-Pratt Spring Dividers No. 517, 8" 1.50

Send check, money order or cash. 25% Deposit required on C. O. D. orders. All prices F. O. B. Culver City, Calif.

AIRBORNE SALES CO., INC. DEPT. PSM 11-8
CULVER CITY, CALIF.

SAVE \$ SAVE \$ SAVE \$

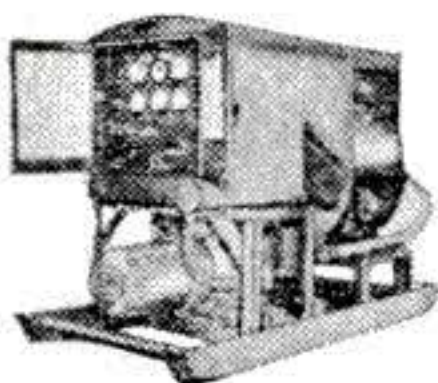
Batteries & AC Generators

Brand New—Guaranteed Gov't Surplus Equip't
BATTERIES—heavy duty for tractors, diesels, trucks—all heavy duty uses—brand new shipped dry charged—guaranteed.

12 volt—EXIDE—150 amp. hr.—
 21 plt. 20³/₈" l.x10¹/₂" h.x9 13/16"
 w.—\$45 ea.

6 volt—AUTOLITE—175 amp. hr.—
 25 plt. 16 3/16" l.x10¹/₈" h.x
 7¹/₄" w.—\$25 ea.

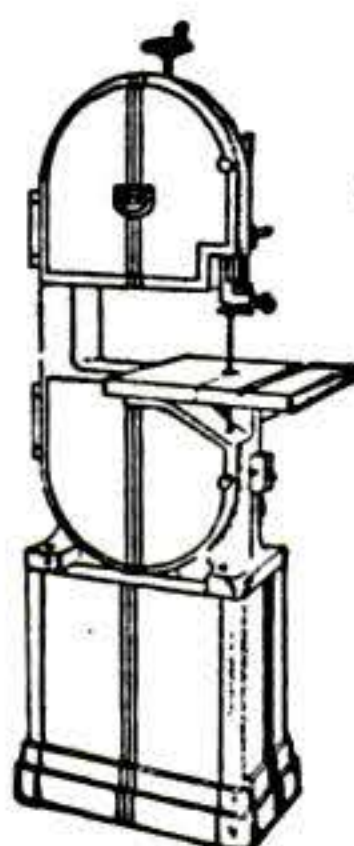
6 volt—GLOBE, EXIDE, WIL-
 LARD—204 amp. hr. 16¹/₈" l.x8¹/₄"
 h.x7¹/₈" w.—\$29.95 ea.



GENERATORS—AC—7.5K. V. A.
 (6KW) complete, self-contained
 PE-99, 120 volts AC, Wisconsin
 gas engine driven generating set.
 3 phase, 60 cycles, built in fuel
 tank. Only 66" long—list \$850—
 Our Price—\$450.

All units delivered as advertised. Prices
 f.o.b. Brooklyn—C.O.D. 25% deposit. FREE
 all steel gas tank with each cash order.

BENJAMIN'S FOR MOTORS
 2100 Mill Avenue, Brooklyn 10, New York



COMPLETE LINE WALKER-TURNER

IMMEDIATE DELIVERY!

Drill Presses, Saw Tables,
 Lathes, Band Saws, Jointers, Ra-
 dial Saws, Sanders, and many
 other Machines—large and small.
 We invite your inquiries.

Send for FREE Catalog "B"

CARPENTERS MACHY. CO.

213 N. 11th St., Philadelphia 7, Pa.

DeLuxe ICE AUGER Makes Ice Fishing Easy

Cuts 7" hole through 30" of ice. Efficient and speedy—cuts
 4" to 10" per minute. Excellent Gift. All steel, wt. 5 lb.
 See your dealer or order direct. \$3.95 each postpaid—
 replacement blades 50c per set. Send check or money order
 today—Money-Back Guarantee. Folder on request.

GREEN STAMPING COMPANY, Nashville, Michigan

Jiffy Jr.
 ELECTRIC
 HEATER



Only
\$2.95
 HOT WATER
 IN A JIFFY
 plus twenty five cents for postage

BOILING HOT WATER IN A JIFFY!!
 Ideal for Christmas Gifts

Place the Jiffy Electric Water Heater into the water and
 insert the plug in the nearest electric wall or light plug.
 You will have hot water in less than five minutes for baby's
 bath, your washing, shaving and a great many other uses in
 the home, camping, business, and on the farm. Mailed com-
 plete, including six feet of rubber covered wires and plug.
 One year guarantee. **JIFFY ELECTRIC COMPANY, Dept.**
SP, 21321 Stephenson Highway, Hazel Park, Mich.



START
As High As \$3,351 YEAR

Prepare NOW for 1949 Examinations
VETERANS GET SPECIAL PREFERENCE

Railway Postal Clerks

Railway Postal Clerks get \$2,750 the first year of regular
 employment, being paid on the first and fifteenth of each
 month. (\$114.60 each pay day.) Their pay is automatically
 increased yearly to \$3,850 and \$4,050 in larger organiza-
 tions. Advance may be had to Chief Clerk at \$5,850 a year.
 (\$243.80 each pay day.) Male veterans only.



**RAILWAY
 POSTAL
 CLERKS**

**3 Days On—3 Days
 Off—Full Pay**

Railway Postal Clerks on long runs usually work 3 days
 and have 3 days off duty or in the same proportion. During
 this off duty their pay continues just as though they were
 working. They travel on a pass when on business. When
 they grow old, they are retired with a pension.

City Mail Carriers, Post Office Clerks

Clerks and Carriers now get \$2,550 the first year of reg-
 ular employment and automatically increase \$100 a year
 to \$3,550. Open to men—women 18 to 50.



Patrol Inspectors

Men 21 to 35. Entrance salary \$3,351
 year. Appointments to positions along
 the nation's borders are made from this
 examination.

Many Other Positions

Many other positions are obtainable.
 Those wishing these positions should pre-
 pare at once.

Get Free List of Positions

Fill out the following coupon. Tear it off and mail it
 today—now, at once.

Although not government sponsored, this can be the first
 step in your getting a big-paid government job.

FRANKLIN INSTITUTE, Dept. H80, Rochester 4, N. Y.

Rush to me, entirely free of charge (1) a full description of U. S.
 Government Jobs; (2) Free copy of illustrated 40-page book, "How
 to Get a U. S. Government Job"; (3) List of U. S. Government
 Jobs; (4) Tell me what to do to prepare for one.

Name

Address Vet. ?.....

Use This Coupon Before You Mislay It. Write or Print Plainly.

BIG MONEY IN WATCH REPAIRING



**LEARN
AT
HOME**

Get into this top-pay, easy-to-learn, uncrowded field thru our unique 10-lesson home study course. Watch makers in big demand. You train step-by-step under experts. We furnish all tools and new 15 jeweled watch. No interference with present job. Get out of the rut—turn spare time into money. More jobs than men to fill them. We have students from 18 to 65 who have profited by our training. Low cost.

Write today for all the facts — NO OBLIGATION.

**ILLINOIS SCHOOL OF
WATCH REPAIRING**

Dept. PS-11

2870 Elston Ave.
Chicago 18, Ill.

HIGH PAY JOBS FOR MEN WHO QUALIFY IN DIESEL



ASSURE YOUR FUTURE. Steady, big pay jobs await men qualified in Diesel, Tractor and Heavy Equipment. Can you take advantage of Diesel job and advancement opportunities in this fast-growing field?

COMPLETE DIESEL COURSE AVAILABLE

If you are ambitious and want to get ahead in this lucrative field, you'll want to know about the complete training in Diesel provided by Interstate. Trains you at home in spare time. Does not interfere with your present job. Covers all phases of operation. Up to the minute. Revised regularly to cover new developments. Free placement advisory service.

YOU OWE IT TO YOURSELF

to investigate I.T.S. home Diesel training. Thousands of students agree it has helped them to better jobs... better pay. It can do the same for you!

SEND FOR FREE BOOK TODAY!

We'll gladly send you our big 24-page book "Getting Ahead In Diesel" FREE! Paste coupon on penny card and mail to



INTERSTATE TRAINING SERVICE
4035 N. E. Sandy, Portland 13, Ore.

Please see that I receive FREE BOOK "Getting Ahead In Diesel":

Name _____ Age _____

Address _____

City _____ Zone _____ State _____ (IM2)

NOW! YOU CAN BUILD YOUR OWN WORKSHOP TOOLS

From our prints, castings and parts.

FREE! Illustrated booklet of

- Tool-post Grinder
- Bench Grinders
- Drill Press Stand, etc.

WORKSHOP TOOLS

Box 518 Merrick, N. Y.



WHITE BLANKET \$12.95



**All Wool
Double Size!**

A real economy buy! All wool, full double bed size, downy soft, springy wool blankets for cozy wintertime sleeping. Guaranteed to keep you toasty warm and give years of hard wear. Have gleaming, lovely satin bindings. You save when you buy from our large Army and Navy Surplus Sales Stock. A tremendous value! You will want one for every bed in the house. Supply limited. Rush order today—only \$12.95.

Come Christmas wrapped if requested. SEND NO MONEY. Just name and address. Pay postman only \$12.95 plus charges on delivery. Cash orders sent postpaid.

LEONARDS & LEE SURPLUS SALES

69-71-73 E. 75th St.

Dept. B-108

Chicago 19

There is **MONEY**
in **LAMPS**

Easy to get your share. No experience necessary. Start lamp business in your home, attic, basement or garage. Highly profitable. Fascinating. Illustrated instructions and wholesale catalog \$1. Simple as A.B.C. Write TODAY.

THE GEARON COMPANY, Dept. S-11
27 S. Desplaines Chicago 6, Illinois



SKYSCOPE

The full 3 1/2 inch portable, Astronomical Telescope that is unsurpassed in efficiency. Complete and ready to use as illustrated. Has 1/4-wave aluminized mirror, 60 power dual-lens ocular and a machine-fitted equatorial mounting. Shows Saturn's Ring, Jupiter's 4 moons and close "double-stars" in excellent definition.

We invite your attention to our free and straightforward descriptive brochure. Price—\$25.00 plus expressage.

THE SKYSCOPE COMPANY, INC.
475-D Fifth Avenue New York 17, N. Y.



LEARN TO DANCE \$1.00

Why be a lonely, unpopular wall flower. Learn all the smart dances from the most modern to the old favorites at home, in private without teacher, music or partner. So simple even a child can learn quickly. Tap dancing, Waltz, Collegiate, Samba, Rumba, Jitterbug and many others, including illustrations. Complete course only \$1.00. Also delightful old Square Dances with illustrations for \$1. Get each separate or both for only \$1.98. If you get both have your choice of free Dream Book or Love Letters. (C.O.D. orders 25 cents extra and postage.)

ROLLDEX—P. O. Box 45, Dept. 73, Huntington Station, N. Y.



Wonders Through The MICROSCOPE

A new book which tells you all about MICROSCOPY. Turn an inexpensive microscope on hundreds of specimens within a stone's throw of your front door and you step off into a new world of wonders. Complete manual for amateurs. How to use equipment, secure and preserve specimens, take photomicrographs, etc. Numerous illustrations. Full cloth bound. \$1.49.

Popular Science Monthly Dept. 118-B, 353 4th Ave., New York 10, N. Y.

UTILITY GRINDERS



Lifetime lubricated ball bearings. Two 6 x 3/4 inch wheels, one coarse, one fine. 115 V., single phase, 60 cycle—3450 rpm. Bright red glossy finish.

1/4 hp—\$25.00 net
1/3 hp—\$27.50 net

HOME WORKSHOP MOTORS

Capacitor type, sealed ball bearings, 1725 rpm. Standardized mounting, with cord, plug and switch.

1/4 hp—\$22.50 net
1/3 hp—\$25.00 net
1/2 hp—\$33.00 net

FOB, Milwaukee. Send check or money order

LAD, INC.

Dept. PS-11

161 W. Wisconsin Ave., Milwaukee 3, Wis.



BINOCULARS TELESCOPES MICROSCOPES

Write for
**BIG BARGAIN
CATALOG**

It's **FREE**

BROWNSCOPE CO.

Dept. 11P

24 West 45th St.

New York 19, N. Y.



WILLARD 2 VOLT \$1.25 BATTERIES

Brand new, compact, spillproof built-in hydrometer, group several together to get higher voltages. Fully guaranteed. Shipped dry, add 35c to cover postage and handling.

MICH. RESIDENTS ADD 3% TAX

N. SILVERSTONE CO.

6532 E. McNichols

DETROIT 12, MICH.

AIR FORCE FLIGHT BOOTS

Genuine A-6-W will keep your feet warm and dry in the coldest weather. Genuine shearling fully lined. Rubber soles and zipper closure. Reconditioned like new. State shoe size when ordering. No C.O.D.'s.



**SURPLUS MERCHANDISE DEALERS, Dept. P. S.
38 WEST 30TH ST. NEW YORK, N. Y.**



TALK-SING thru your own radio
with
RADIO MICROPHONE

Be the life of the party. Put on your own broadcasts at home. Talk-Sing, make announcements from any room. Wonderful voice practice. Microphone easily attached to any radio. Follow enclosed instructions. **SEND NO MONEY**—pay Postman \$1.98, plus postage. Send Money Order or check and save postage.

EMPIRE RADIO & TELEVISION CO. (Dept. S.5) 1521 Bedford Ave., Brooklyn 16, N. Y.



HOW TO BE SUCCESSFUL IN THE FAST GROWING PLASTICS INDUSTRY



LEARN at HOME in Spare Time—

Consider the important Plastics field for your future career. More products are being manufactured from plastics than ever before—making more opportunities for trained men and women. Mail the coupon below for illustrated literature which shows the many uses of plastics and what trained men must know to succeed in the Plastics Industry.

STUDY AT HOME

OR COME TO CALIFORNIA

Take famous Plastics Institute home training or come to Los Angeles for practical work in modern laboratories and shops. Students from foreign countries and many states now attending.

START YOUR TRAINING NOW—mail coupon and get started on the road to success in the great and growing field of Plastics.

PLASTICS INDUSTRIES TECHNICAL INSTITUTE

Approved for Veterans • Available for Non-Veterans

You Get 7 BIG Plastic Material KITS with your course and can make these and many other attractive, useful articles while learning.



**SEND FOR
FREE CATALOG
TODAY**

PLASTICS INDUSTRIES TECHNICAL INSTITUTE

Dept. PS II-8 1601 S. Western Ave., Los Angeles 6, Calif.

Gentlemen: Please send me free literature and information on job opportunities. I am interested in Home Training ☐ attending school in Los Angeles ☐

Name _____ Age _____

Street _____ Zone _____

City _____ State _____

Veteran _____ Non-Veteran _____

NOVEMBER 1948 61

Check these
**SMASHING
BARGAINS**

WAR Surplus

Listed here are a few samples of the unusual bargains that are being offered in both War Surplus and other merchandise. Take advantage of these super-specials.

NAVY STYLE

NEW. Rugged, comfortable. Reversed uppers, full oak leather inner sole, extra composition outer sole. Add 22c post.

**FIELD
SHOES**
4.99



6 TO 12

BOMBER JACKET

13.99

**B-15
STYLE**



**SIZES
34
TO
46**

NEW. Water repel. Mountain cloth outside, full pile lining incl. sleeves, 4 pockets. Wool knit wristlets, waistband. Gen. monton collar. Add 35c postage.

SPECIALS

• O. D. WOOL SERGE

Shirts 13-15	Pants 28-34
\$2.79	\$2.95

Used, perfect condition. Cleaned and pressed by the Q. M. Corp. 100% wool serge. Add 10c post.

• DUST MASKS

NEW. \$1.50 value. Ideal for millers, farmers, paint and insecticide spraying. Add 6c post. **33c**

Khaki Shirts 14-17	Suntan Pants 29-42
\$2.99	\$3.88

NEW genuine 8.2 khaki chino material. Trousers with cuffs. Add 10c post.

• NAVY T-SHIRTS

NEW. Full cut. White only. Fine combed yarn. Add 6c post. **69c**



77c EACH *Surplus* **50%
WOOL
SHIRTS
DRAWERS**

NEW. Shirts: long sleeves, crew neck. Drawers: ankle length. Medium weight, 50% wool. O. D. color. Add 10c post.

OFFICER STYLE OXFORDS

6.95



• BROWN
• BLACK

NEW. Finest quality uppers, best oak bend leather outer sole. Half leather lined. Add 20c post.

MAIL ORDERS

Please remit with order. Be sure to include postage. Satisfaction or money back.

**SIoux FALLS
SURPLUS STORE
SIoux FALLS, S.D.**

Genuine NYLON

PARACHUTE CORD PER HANK

NEW. Ideal for clotheslines, drapery, venetian blind cords, ect. 550 lbs. tensile strength. 3/16" diameter. Add 7c post. **59c**
50 FT.

**SEND FOR
FREE
Surplus
CIRCULAR**

Say You Saw
It In Popular Science

Table Top MODEL RAILROAD!



**SWITCH ENGINE
KIT.....\$22.00**
**BOX CAR AND
CATALOG.....\$1.60**

Ask your Hobby dealer to order for you or send direct. New 1949 catalog 20c.

Have fun building and operating America's smallest railroad models. Accurately scaled 10 ft.—1 inch. Track (TT gauge) only 15/32" wide. You can hold a "big" locomotive in the palm of your hand... have track switches galore without crowding. Ideal for a card table or desk-top layout. Build engines and cars from kits or buy ready-to-run. Streamliners, Diesels, Steam Locos, Freight and Passenger Cars. **COMPLETE TRAIN SET KIT WITH ENGINE, 3 CARS, AND 10 1/2 FT. TRACK.....\$29.95**

H. P. PRODUCTS CO., Hartford City, Indiana

New ELECTRICAL Handbook

New handbook, sized for on-the-job use, gives working data to help contractors, inspectors, apprentices, home, farm, and industrial electricians save time, trouble—do the expert work that leads to better pay. Answers your questions on Code requirements, fundamentals, mathematics, tools, materials, wiring, testing, etc.—gives most needed facts on everyday jobs in planning, installing, maintaining electrical services. Many diagrams, charts, tables, formulas, etc.

**Hundreds of
facts & methods
ONLY \$2.50**

Goldberg's ELECTRICIANS' POCKET COMPANION

FREE TRIAL Just write name, address, and occupation in margin and mail ad. We'll send book and after 10 days, you can send us \$2.50, plus a few cents postage, or return book postpaid. Postage paid on cash orders; same return privilege.

Dept. PSM-118,
232 Madison Avenue

MURRAY HILL BOOKS, INC.
New York 16, N. Y.

Say You Saw
It In Popular Science

Imported Swiss Watches



GUARANTEED BY MFGR. FOR FULL YEAR!

Marvelous value in a handsome watch, made by skilled Swiss craftsmen. So good that a printed one-year guarantee is included. Has timed and tested movement, red sweep-second hand, glow-at-night dial.

SEND NO MONEY—WEAR ON TRIAL

Pay postman \$6.95, plus tax and postage (or send check and we pay postage). Return in 10 days if not delighted. Address Dept. 811-B.

**ONLY
\$6.95**
plus
69c
tax

Swiss Watch Distributors
211 Paramount Bldg. Atlanta, Ga.

DOWEL TROUBLES?



Now you can make dowels that match your wood! Amazing new

SPEE-DOWL makes perfect, burnished dowels for arrows, cabinet work or other projects. Simply rotate wood in lathe or drill press and push on **SPEE-DOWL** like pencil sharpener. Cast aluminum body, tool steel blade. A necessity for fine craftsmanship. Available in 2, 3, 4, 5, 6, 7, and 8/16" sizes. Only \$1. Special—any 4 sizes \$3; complete set of 7 for \$5. **SENIOR MODEL**, 9/16" to 1 1/4" only \$2.65 ea. Send postal note or check **NOW** for your **SPEE-DOWL**. Unconditionally guaranteed. Free literature.

**GUIDE FINISHED
CHUCK BLADE HOLES DOWEL**

JOHNS MFG. CORP., Dept. B-15 501 Bound Brook Rd. Dunellen, N. J.

HARD-TO-GET CRAFT MATERIALS

EVER TRY TO GET STARTED ON A PROJECT AND FIND YOU COULDN'T GET MATERIALS LOCALLY? That needn't happen again. Just write to the Craftsman's Guild for further information about:

- **WOODS**—fine selected kiln-dried hardwood, walnut, mahogany, plywood, lumber core stock, etc.
- **HARD-TO-GET HARDWARE**—Decorative hinges, brackets, knobs, finished screws, etc.
- **FINISHES** • **STAINS** • **MOLDINGS** • **FILLERS** • **VARNISHES**

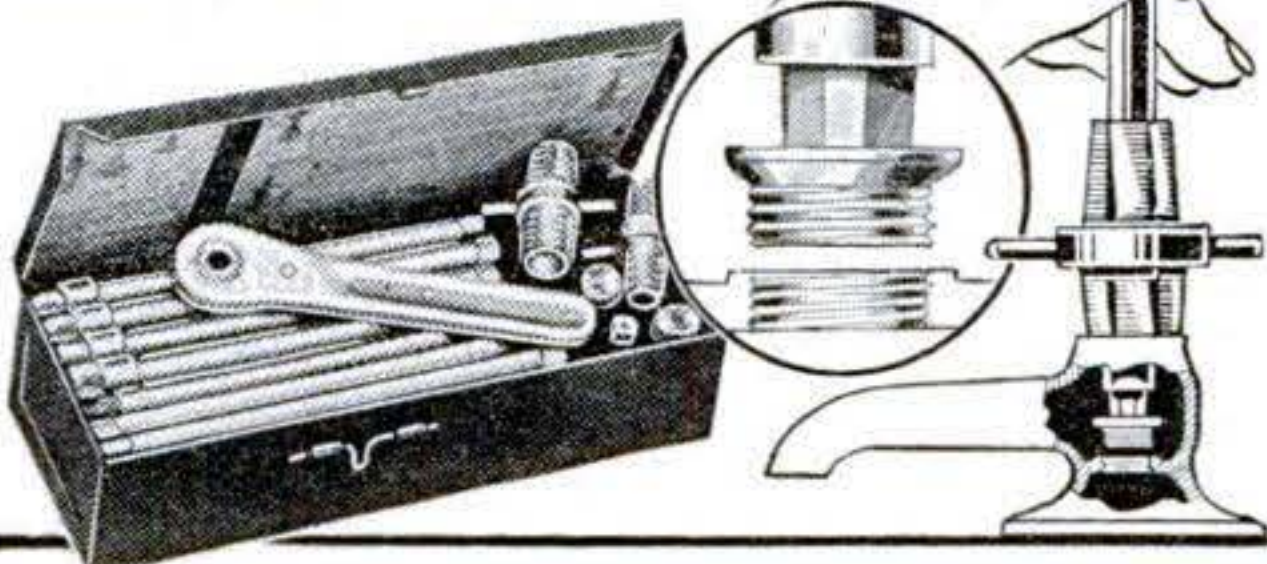
HOBBY GIFT KITS—50c and up

SEND TODAY for Free Catalogue (enclose only 3c to cover postage)
CRAFTSMAN'S GUILD, Marlboro, New Jersey

STOPS LEAKS PERMANENTLY

Cut your fixture replacement, water and fuel bills with Economy Renewable Seats. Make economical, permanent repairs quickly and easily with the Junior Kit (illus.). Repair bathroom, kitchen and laundry fixtures. Everything you need included in steel box. This is a natural for the "Fixit" shops—get extra income from making permanent repairs on your customers' faucets.

Senior Master Kit also available—repairs faucets and valves up to 1" pipe. At better Jobbers and Hardware Stores . . . or Write Direct.



ECONOMY VALVE SEAT CO.

3122 N. California Avenue, Chicago 18, Ill.

BOMBER JACKET \$14.95

ALPACA-LINED
WIND-PROOFED



This is the genuine ARMY AIR FORCE B-15 jacket—not an imitation. **BRAND NEW!** Has fine lustrous genuine mouton collar and storm tab. 2 outside snap-fastened pockets. Full zipper front with wind-proof flap. Knit cuffs and bottom. Sizes 36 to 46. Made of sturdy Mountain Cloth (9 oz. Sateen) in O.D. shade. Formerly sold for \$20.00. Now only \$14.95! An ideal Christmas gift. **SEND NO MONEY!** Just name, address, size. Pay postman only \$14.95 plus charges on delivery. Cash orders sent postpaid.

LEONARDS & LEE SURPLUS SALES
69-71-73 E. 75th St., Dept. BJ-118, Chicago 19

LOOK! Famous AAF N3C Sight

CONTAINS EXCELLENT F2.5 LENS having 5 1/2" focal length, front-surface optical mirror, reticle and 24-volt bulb. **FREE** instructions included for converting to projector, telescopic gun sight, telescope, telephoto lens for movie or 35-mm camera, projection pointer, and many other valuable items. New, in original cartons, AAF cost nearly 20 times this value. Send check, money order or C.O.D. instructions. Prepaid orders sent postpaid.



\$2.49

MICRONICS CO., 1818 W. Foster Ave., Chicago 40, Ill.

Say You Saw
It In Popular Science

EQUIP YOUR MALL SAW MODEL 60 with a ZMCO ANGLE-DEPTH ATTACHMENT



• Make perfect fitting straight and compound miter cuts quickly and easily. Regulate cutting depths with hair-line accuracy from 0" to 2". Bevel cuts to 45°.

Fastens securely to your Mall Saw Model 60 with no holes to drill. Lightweight, sturdy steel construction.

Dealer Inquiries Invited

Order today by mail

\$8.90
postpaid

ZIEROLD MFG. CO. P.O. Box 509-R Burbank 11, Calif.

New SUN RAY Aristocrat ENLARGER

GIVES YOU
TOP FLIGHT
ENLARGEMENTS

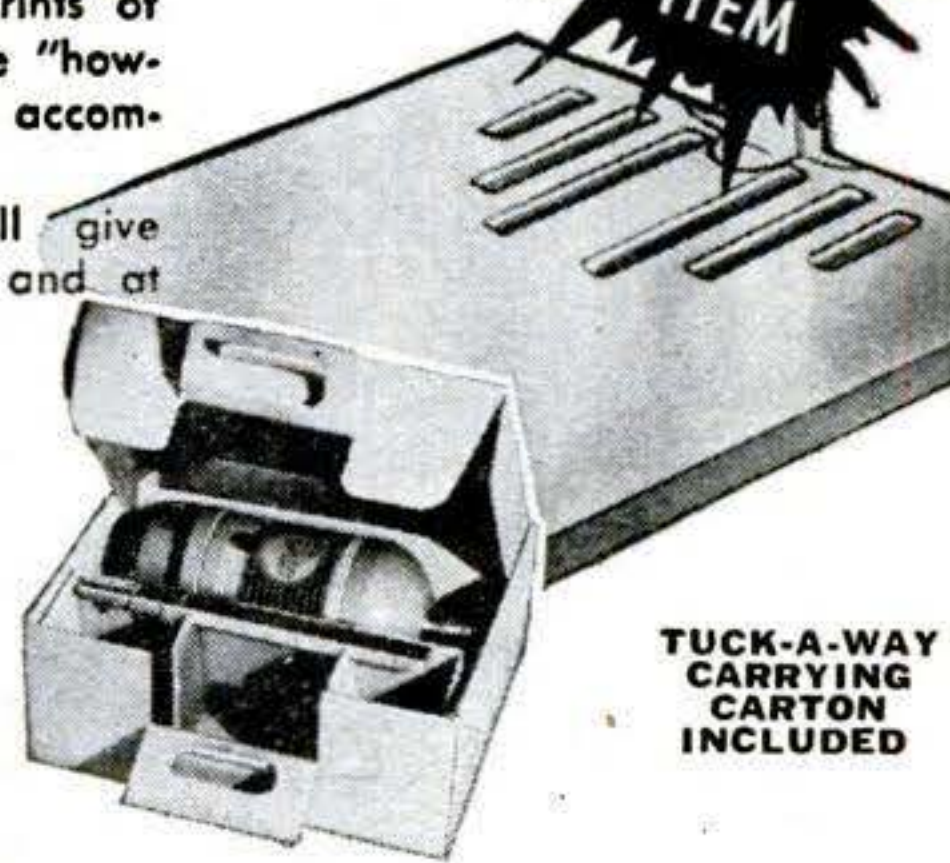
ONLY
\$14.95
COMPLETE

**MADE & GUARANTEED BY
ONE OF AMERICA'S LARG-
EST AND OLDEST M'F'G'S OF
QUALITY ENLARGERS**

Here's the greatest opportunity ever for beginners in photography to get exciting new thrills out of making fine, beautiful enlargements . . . AND AT LOW COST. Whether you want to make a career or gain in skill and knowledge, the ARISTOCRAT 2 1/4 x 3 1/4 enlarger will give you smart, crisp, snappy professional looking enlargements. The ARISTOCRAT not only fits into your budget but fits equally well into small space and can be used effectively in a closet or small room, where space is an important factor. Hollywood prints are within your grasp . . . as you become familiar with this new enlarger sensation. The moment you start using it you will see how easy and simple it is to make fine large prints of your negatives. Simple "how-to-do" instruction book accompanies each enlarger. The ARISTOCRAT will give splendid performance and at a low cost.



**AN
UNUSUAL
GIFT
ITEM**



**TUCK-A-WAY
CARRYING
CARTON
INCLUDED**

**START NOW TO
MAKE GOOD
ENLARGEMENTS**

See it. Try it.
You will be
amazed at its
remarkable re-
sults . . . all
for only
\$14.95
Complete
Send your
order **NOW**

The ARISTOCRAT is compact, portable, rugged . . . yet it has all of the features necessary for making fine enlargements. It accommodates all negatives from 35 mm up to 2 1/4 x 3 1/4. It contains bulb, diffusing glass and is wired for use on AC or DC. The lens is fitted into a precision focusing mount from which pin-point accuracy and sharpness is assured. Supplied with a durable, heavy, double fibre negative holder . . . easily accessible "in or out" of the enlarger's special "Open Jaw" arrangement. Its telescoping upright shaft fitted into a metal baseboard is collapsible so that the entire unit can be stored away in small space.

PHOTO HOBBY, INC., 489 FIFTH AVE., DEPT. P.S. NEW YORK 17, N.Y.

Gentlemen: — Please send at once the ARISTOCRAT enlarger so that I can get started on my career as a photographer. I am enclosing check ☐ money order ☐ for \$14.95 Postpaid. (See note below).

Name

Address

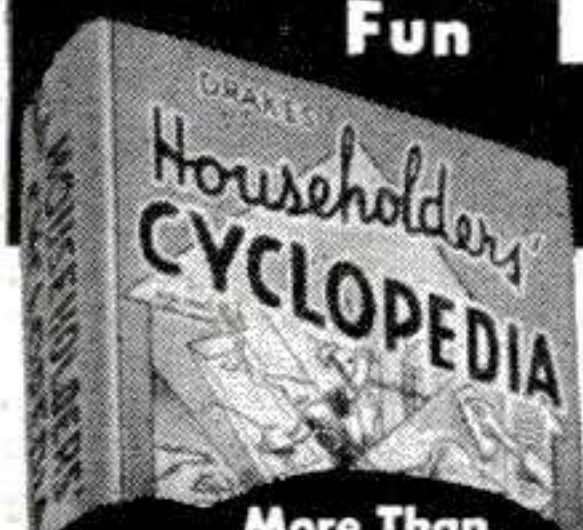
City State

NOTE: Should you want the ARISTOCRAT sent C.O.D. plus postage please indicate same by checking here ☐.

Save Money
Enjoy the
Fun

DO EVERY HOME JOB YOURSELF!

Save Hundreds of Dollars Every Year!



More Than
700 Jobs Explained
and Illustrated!
1000 PICTURES
640 PAGES

Tells Everything—Shows Everything—Repairing, Remodelling, Modernizing, Carpentry, Painting, Decorating, Plumbing, Heating, Electric Wiring and Appliance Repairs, Furniture Repairs, Etc.

Written in plain English. 1000 pictures make everything simple as A.B.C. This book can save you hundreds of dollars every year.

Get This Amazing Book Today. Mail Coupon

This is a real HOW-TO-DO-IT book that gives step by step instructions, explaining the simplest and least costly, effective methods for hundreds of regular jobs around the home which require only ordinary materials and simple hand tools.

Use it to improve your home in many ways, to make alterations, extensions and repairs—use it to repair electrical appliances, do electric wiring, plumbing, etc. Use it to rejuvenate and modernize your equipment and furnishings and to make your home the delightful, livable place you have always wanted, without having to worry about the cost. With the Householders Cyclopaedia to guide you all repairs, alterations and improvements can easily be yours.

MAIL COUPON

Get this helpful book now. Turn spare hours into the things you want and save money besides. Mail the coupon below for quick delivery right to your home.

Frederick J. Drake & Co., Dept. 58

117 Green Bay Road, Wilmette, Ill. (Suburb of Chicago)

Rush Drake's Householders Cyclopaedia, price \$5.00. If not pleased with this book I will return it in 5 days and you will refund my money.

() Remittance enclosed. Send fully prepaid.

() Send C.O.D. I will pay postman plus postage and C.O.D. charges.

Name.....

Address.....

City.....State.....

2 NEW WORKSHOP ACCESSORIES...



\$18.95

F.O.B. Detroit

PRECISION-BUILT 12" JIG SAW... \$14.95 F.O.B. DETROIT

Powerful, accurate, husky design with dust blower, adjustable heat treated saw and work hold down guide, 45° tilting table, Oilite bearing and heat treated parts for extra wear, smoother faster operation. Ideal for home craftsmen, model and novelty makers. Uses 5" pin or sabre saw—1/6 to 1/4 H.P. motor. Shipping weight 20 lbs. Motor not included.

**ALL-PURPOSE TILT-TOP
POWER TOOL STAND**
Completely adjustable to offset angles of any tilting table machine. Brings working surface into true horizontal. Greatly facilitates manipulation and feed of work. Converts any tilting table bench saw into equivalent of tilting arbor saw... **AT A BIG SAVING.** Solid 3/4" treated plywood 16" x 28" table, 25" high. Heavy formed steel legs. Two trunnions with solid locking handles. Angle of tilt 0° to 45°. Shipping weight complete 45 lbs.



FULL 10 DAY MONEY BACK GUARANTEE

At your Dealer — Or Order Direct
FREE LITERATURE ON REQUEST

BUSH MFG. COMPANY

CLAWSON, MICH.

Say You Saw It In Popular Science

Outstanding Surplus Value!

BRAND NEW—GUARANTEED

GRINDING WHEEL KITS

HUNDREDS OF ASSORTED ITEMS — A \$50 VALUE



FOR CUTTING,
SHAPING,
GRINDING,
& POLISHING
WOOD, METAL
OR PLASTIC.

While supply
still lasts, only

\$8.95
Per
Complete
Kit

F.O.B. Chicago

SET INCLUDES OVER 300 ITEMS

Here is the list.

- 35 Grinding and cut-off wheels, sizes 1 to 5 inches, 1/8 to 3/4 hole
- 10 Mounted stones—3/32", 1/8", 1/4"
- 3 Steel cutters 1/8"
- 5 Steel cutters 3/32"
- 1 Steel circular saw mounted on mandrel
- 1 Drum sander 1/2" mounted on 3/32" mandrel
- 6 Cut-off Wheels on 1/8" mandrel
- 1 One inch buff on 1/8" mandrel
- 1 One inch felt wheel on 1/8" mandrel
- 1 7/8" rubber wheel on 1/8" mandrel
- 2 High speed rotary files 1/4" shank
- 100 3/4" cloth butterfly abrasive discs
- 1 One inch wire wheel 5/8" hole, brass center
- 10 Cloth abrasive discs
- 3 Sheets crocus cloth 9 x 11
- 1 Box paper discs—100
- 2 Leather wheels
- 1 Roughing stone
- 1 Bristle brush 3", 5/8" hole, brass center
- 10 Sanding rolls
- 3 Honing stones
- 1 Rag wheel—4 inch
- 6 Sanding sleeves
- 2 Felt bobs

In sturdy compact container 13 1/4 x 9 1/4 x 2 1/2", weight 8 1/2 pounds; with installed rack for all drills.

Satisfaction Guaranteed

- 2 Leather wheels
- 10 Sanding rolls
- 6 Sanding sleeves

- 1 Roughing stone
- 3 Honing stones
- 2 Felt bobs

- 1 Bristle brush 3", 5/8" hole, brass center
- 1 Rag wheel—4 inch

I enclose \$8.95 ☐ Check ☐ M. O. ☐ Send C. O. D.

Name.....

Address.....

City.....Zone.....State.....

GROBAN SUPPLY CO. 1522 So. Michigan Ave.
Dep't. PS-11, Chicago 5, Ill.

Learn A Trade NOW! PRACTICAL SHOP TRAINING!

In Our Chicago Shops

- ☐ AUTO MECHANICS
- ☐ DIESEL MECHANICS
- ☐ REFRIGERATION
- ☐ WELDING—ARC and GAS
- ☐ MACHINIST
- ☐ PIANO TUNING

Above Approved For G. I.'s and Civilians

- ☐ BODY-FENDER

One of America's Leading Practical Schools
7 Floors of Fully Equipped Shops
Over 48,000 Successful Graduates
Expert Individual Instruction
Learn by Doing—Low Living Expense
Established 1902—Day and Evening Classes

Also the following Home Study Courses

- ☐ PLASTIC
- ☐ REFRIGERATION
- ☐ DIESEL

—CALL IN PERSON OR MAIL THIS AD TO—

GREER SHOP TRAINING

(Dept. PSM-38) 460 South State St., Chicago 5, Ill.

Please send without obligation free information regarding trade checked above. (Specify whether you are a Veteran ☐ or Civilian ☐)

Name.....Age.....

Address.....

City.....State.....



GET INTO DRAFTING

The Draftsman Plays a most Important Part in INDUSTRY

DRAWING OUTFIT INCLUDED with Drafting courses.

All the tools you need including folding drawing table. With them you can put your ideas on paper quickly and with accuracy. With training you are all set to master Drafting in months, —not years—at home.

Learn in Spare Time—At Home! (or at the College in Chicago)

A few hours of pleasant home study every week—that's all. With Chicago Tech's help, you train yourself step by step. This tested method—developed over 44 years of C.T.C. progress—prepares men for good positions in industry.



**CHICAGO
TECHNICAL COLLEGE**
P-225 Tech Building, 2000 South Michigan Ave.
Chicago 16, Illinois

Practically everything that's built or manufactured these days is constructed from blue print drawings prepared by the draftsman. He is the KEY man in industry. No new machines can be built, no bridges erected, no buildings constructed until the draftsman has completed his work.

Drafting is clean, interesting, professional-type work. The draftsman is paid well to start. And he has real opportunities for advancement to high-pay jobs in Engineering. The tremendous production programs ahead in industry will require more draftsmen than ever before.

Send today for free information. See what this training has done for others, what it can do for you. Simply MAIL COUPON TODAY in an envelope or use a penny postcard.

MAIL COUPON NOW

CHICAGO TECHNICAL COLLEGE

P-225 Tech Bldg., 2000 So. Michigan Ave., Chicago 16, Ill.
Mail me FREE Drafting Lesson with information about big opportunities in DRAFTING and how I can train at home.

- ☐ Architectural Drafting ☐ Electrical Drafting
☐ Machine Drafting ☐ Structural Drafting
 ☐ Builders' Course

Name.....Age.....

Address.....

City.....Zone...State.....



Profit and Fun **CARVING LEATHER** *at home spare time full time*

New Device makes it possible for beginners to improve overnight. Now is the time to cash in on this Big Paying business — year round profits are easy if you follow new method of instruction to be found only in Baird's home study course. Big sale for bill folds, wallets, belts, purses, gun holsters, saddles, and other leather articles. Make up to \$50.00 per week spare time or up to \$500.00 or more monthly full time.

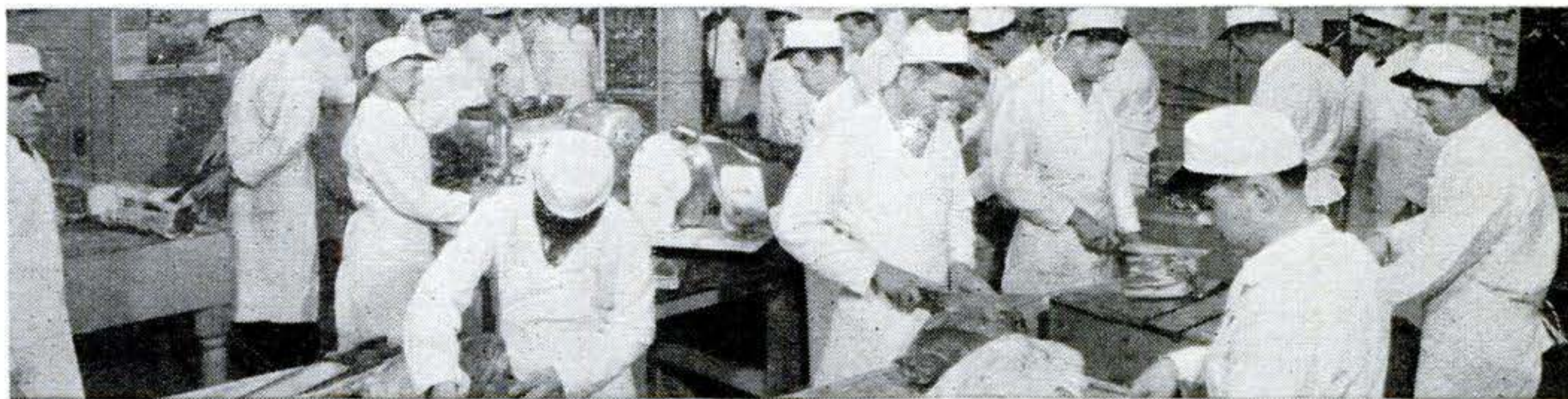
BAIRD SCHOOL OF LEATHER CARVING • 221 Manitou Ave., Manitou Springs, Colorado

Start your own business. Make Xmas presents and other gifts. The Baird Course is Complete. Full instructions — Tools and equipment — including new device that makes learning easy. Write for full details and interesting catalog — containing many profitable suggestions — Sent Free — Write Now.

DEPT. E

LEARN MEAT CUTTING EASILY - QUICKLY

At Home-In Spare Time



The steady, dependable trade of Meat Cutting taught easily, quickly by improved HOME METHOD. National School, established over 25 years, has organized its famous "Learn By Doing" Classroom, Cutting room and Retail Market training system into sound, practical HOME STUDY form.

Now, by the miracle of this EXTENSION TRAINING you can prepare in Your Spare Time At Home, for a better job, bigger responsibilities or success and security in a store of your own. Remember, PEOPLE MUST EAT!

Buying, cutting, percentage, pricing, advertising, selling—a complete meat education. For beginner or men with ex-

perience. Thousands of successful graduates. Send coupon for FREE Bulletin NOW!

MAIL THIS COUPON TODAY FOR FREE BULLETIN

National School of Meat Cutting Div. 072, Toledo 4, Ohio

Send me your FREE Bulletin on Meat Cutting and Meat Merchandising. No obligation. No Salesman will call.

Name.....

Street.....

City.....State.....

INVENTORS

When you are satisfied that you have invented a matter of value—write me, without obligation, for full information as to what steps you should take to secure a Patent. The usual first step is to have a search of the prior U. S. Patents conducted, so that I can report to you on the question of Patentability.

PATRICK D. BEAVERS
(Formerly RANDOLPH & BEAVERS)
Registered Patent Attorney

937 Columbian Building, Washington 1, D. C.

PATRICK D. BEAVERS, Registered Patent Atty.
937 Columbian Bldg., Washington 1, D. C.

Please send me full information on how to secure Patents & Trademark Registration.

Name.....

Street.....

City.....State.....



949 PIECES Only \$4.98

FOR CHRISTMAS AND NEW YEAR!

Noise and Beauty. Also great bargains in Safe and Sane All-Beauty, No-Noise Assortments. Write today for FREE CATALOG.

STARS and STRIPES FIREWORKS CO.

P. O. Box 486, Ft. Worth 1, Tex., Dept. PS

(Not intended for sale where regulations prohibit)

Lathe Collets



Precision Steel and Brass Collets for South Bend Lathes or other makes of lathes or machines that they will fit.

Collet No.		3	2	4	5
Max. Cap. In.		1/2	11/16	3/4	1
Thread Dia. In.		.650	.855	.950	1.250
Thread Lgth. In.		3/4	13/16	13/16	3/4
Threads Per In.		26	20	20	20
Body Dia. In.		.6495	.8595	.9495	1.2495
Collet Lgth. In.		2-11/16	3-5/16	3	3-9/32
Head Dia. In.		.852	1.095	1.150	1.452
Head Taper Deg.		12	15	10	10
Prices	Steel	\$3.75	\$4.00	\$4.25	\$4.75
Postpaid	Brass	\$2.00	\$2.25	\$2.35	\$2.50

SOUTH BEND LATHE WORKS
456A E. Madison St.
South Bend 22, Indiana

ELECTRICIANS

Get this Great Book

FREE

For Merely Examining
Coyne's NEW Pay Raising

Book of 150
Shop Prints,
Wiring
Diagrams,
Full Size
8 1/2 x 11"



8 Volume Set APPLIED ELECTRICITY

Here's a brand new set of electrical books to give you the "know how" on all branches of electricity from appliance repairing to D.C. and A.C. equipment, electrical refrigeration, Industrial Electronics, etc. 3,400 subjects, 11,500 facts, latest methods explained in easy to follow instructions. To prove how valuable and Practical this set can be to you, I'll give you a FREE copy of my book "150 Shop Prints and How to Read Them" just for looking over this set. Written by the Coyne Staff and backed by 47 years' experience, this set has helped many ambitious electrical workers to bigger pay and added opportunity.

OFFER LIMITED • ACT NOW! If you act promptly, I'll send you the 8 volume set Applied Practical Electricity for 7 days FREE examination... together with the 150 Shop Print Book. Look the set over 7 days. If you like it send either \$22.75 cash or \$3.00 after 7 days and \$3.00 per month until \$24 is paid. If you don't want the set, return it and YOU OWE NOTHING. In either event you keep the 150 Shop Print Book absolutely FREE.

Coupon below is just a request to see the books free and to get my gift book for doing it. ACT—Send coupon Today!

Technical Book Div. **COYNE ELECTRICAL SCHOOL**
500 S. Paulina St., Dept. 88-R8, Chicago 12, Ill.

FREE BOOK Coupon

SEND NO MONEY

B. W. Cooke, Director. **COYNE ELECTRICAL & RADIO SCHOOL**
500 S. Paulina St., Dept. 88-R8, Chicago 12, Ill.

O. K. send me, postpaid, Coyne's new 8 volume, "Applied Practical Electricity" for 7 Days FREE TRIAL per your offer. Also send, absolutely FREE, the book of 150 Shop Prints as a gift.

Name.....Age.....

Address.....

Town.....Zone.....State.....

Say You Saw
It In Popular Science

WORK PANTS

Bargain!



A REAL
BUY
AT ONLY **99¢** pr

An amazing bargain! These sturdy, serviceable work pants, though used, have been washed and sterilized, put in perfect condition—the best work clothing value you've ever seen. Every pair full cut from durable, heavy weight wash materials—choice of blue or tan. Well made with reinforced stitching at strain points—and we have your size in stock. Satisfaction guaranteed or your money back! Rush your order for several pairs now! Supply is limited.

SEND NO MONEY! Pay postman amazing low price of 99¢ per pair plus postage, or send money and we pay postage. Examine 10 days, if not delighted return for instant refund!

MILCO SALES, Dept. 461
9350 ROSELAWN • DETROIT 4, MICHIGAN

Please send me.....prs. work pants
Waist.....Leg Length.....
Color (1st and 2nd choice).....
C.O.D. ☐ Payment enclosed. Send prepaid. ☐
NAME.....
ADDRESS.....
CITY-ZONE-STATE.....
WORK SHIRTS TO MATCH.....69¢ Each
Send.....Shirts Neck Size.....
MATCHING COVERALLS.....\$1.49
Send.....Coveralls Chest Measurement.....

How to Write

Short Stories, Mysteries, Novels,
Articles—at home in spare time

The demand for writers is creating great new opportunities for people with an urge to write. It's not as hard to succeed as you may imagine. Most famous authors come from ordinary walks of life. At home, you too may learn fiction writing, the best basis for all fields—short stories, features, articles, technical, mechanical and business items. Palmer Institute's Home Study Training (Established 1917) is endorsed by

Rupert Hughes, Gertrude Atherton, Keith Monroe, and other famous authors and by scores of successful graduates. Complete instruction material and professional coaching to develop your own style. FREE book and lesson show how you may enjoy an ideal part time or full time career. Write today (no salesman will call). Veterans: advise us if you are eligible for G.I. Training.

PALMER INSTITUTE OF AUTHORSHIP • Desk U-118 • 1680 N. Sycamore • Hollywood 28. Calif.

UP TO 80% SAVINGS ON WAR SURPLUS

LIVE RUBBER SHOCK CORD
Made in accordance with rigid army specification. Clean fresh stock. 5/8" contains approx. 500 strands of live rubber, 3/8" approx. 100 strands, 1/4" approx. 40 strands. Sold in 25 ft. lengths or more. At about 20% of original cost.

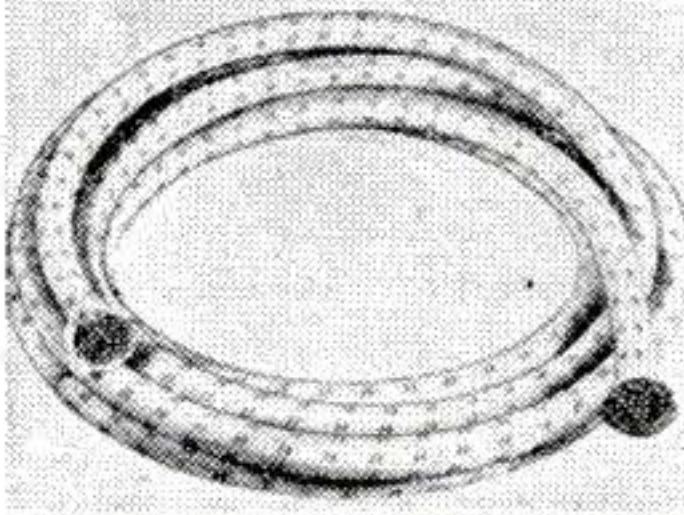
DIA.	PRICE (per 25')	Ship. Wt.
1/4"	\$1.00	2 lbs.
3/8"	\$1.25	2 lbs.
5/8"	\$1.75	3 lbs.

LT. WT. ALUMINUM PIANO HINGE
Length 72 inches, thickness .040—width 1 1/4"—Operating radius 275 degrees. Made of aluminum alloy, sold in 6 feet lengths only—**\$1.14** per length....

HEAVY DUTY STEEL PIANO HINGE
Length 56" — Thickness 3/32" — Width (open) 3-5/16" — Operating radius 330 degrees—Made of heavy duty steel—Drilled ready for use. Ideal for drop tables, heavy tool boxes, heavy doors, and many other uses where heavy hinges are required. Sold in 56" lengths only. Ship. Wt. 7 lbs. At a fraction of original **\$1.45** cost.....

Prices F.O.B. Chicago. Include approx. postage on orders paid for in advance. C.O.D. orders enclose 25%, balance sent C.O.D. WRITE FOR FREE ILLUSTRATED CIRCULAR.

U. A. S. Corp. Dept. PS-11 5637 W. 63rd Pl. Chicago, Illinois





BUILD YOUR OWN ENLARGER
Enjoy Photography's most fascinating hobby at a fraction of usual cost. With simple step-by-step instructions and diagrams plus a screwdriver and pliers you assemble your own Enlarger and Save! Get all features of more expensive Enlargers: precision machined aluminum alloy castings, 90° tilt for wall projection of prints, spherical aluminum lamp-house, helical rack and pinion focusing with extra large knobs, unconditional guarantee. For 35mm to 2 1/4 x 3 1/4 negatives. Time payment plan.

Write Today for Free Illustrated Folder
CALIFORNIA TECHNICAL PRODUCTS CO.
448 So. Hill, Dept. K-11, Los Angeles 13, Calif.

WANTED

PRACTICAL RADIOMEN

Your FCC License Is The Next Step Up!
Better radio jobs require an FCC license. We train and coach you in a few short weeks to get it, but you must have some practical experience, or be a graduate of basic home study or resident radio course. Send outline of your radio experience to get Free Book, "How to Pass FCC License Exams."

Passed FCC Exam with Ease
"I am writing this letter with a million thanks to you and Nilson's Master Course. This course sure helped me pass the examination with great ease."—Student No. 2714N12.

FREE BOOK
How to Pass FCC LICENSE EXAMINATIONS

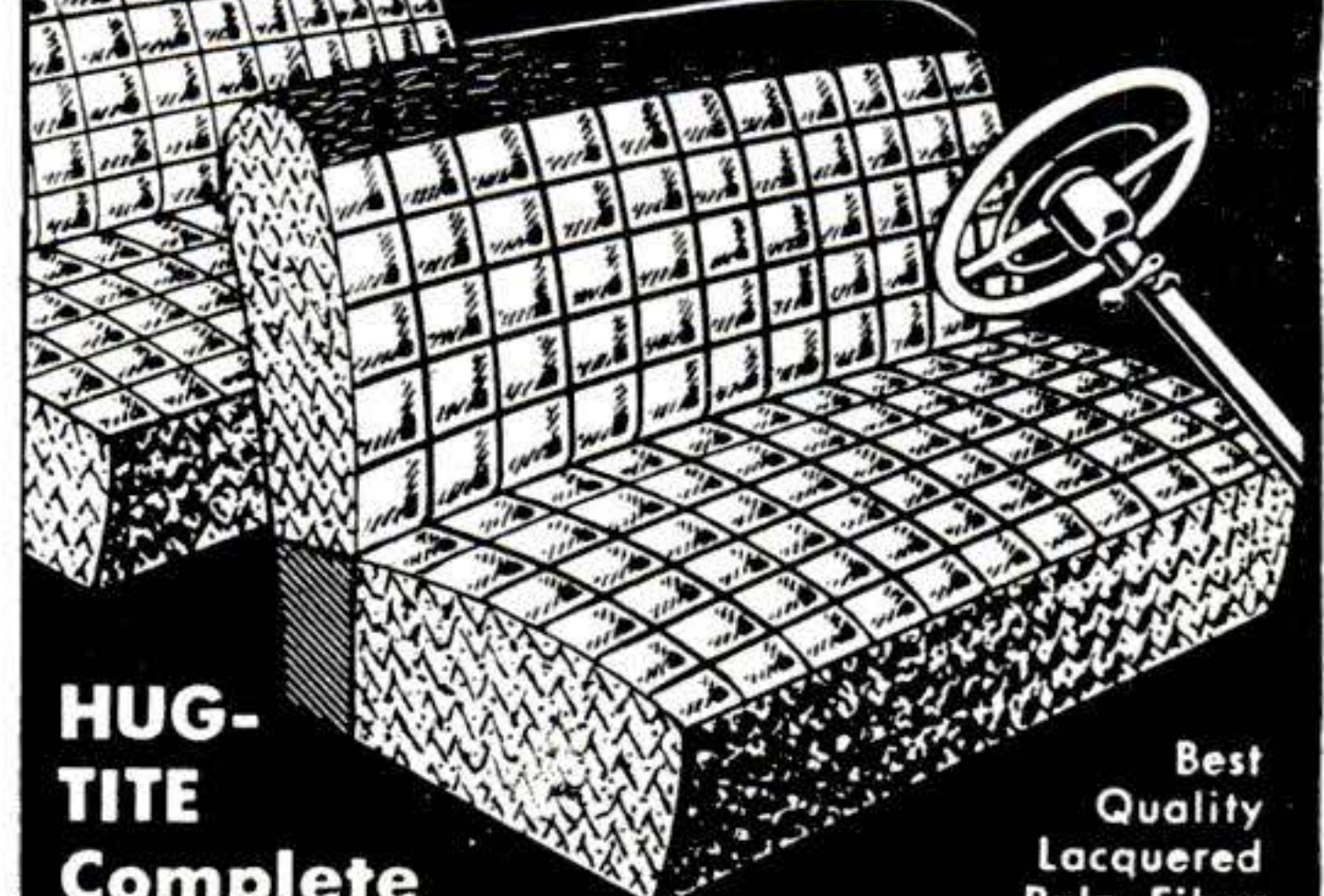
MAIL NOW!

Cleveland Institute Of Radio Electronics
PS-11 Terminal Tower Cleveland 13, Ohio
Send me FREE book, "How to Pass FCC License Exams" (does not cover amateur license exams). I am enclosing an outline of my practical radio experience or training.

NAME
ADDRESS
CITY STATE.....
[] Veterans check for G I enrollment information
NO OBLIGATION — NO SALESMEN

SAVE 1/2 BY MAIL

Beauty — Comfort
Plus Lowest Price
In History



HUG-TITE Complete

Best Quality
Lacquered
Pulp Fiber

AUTO SEAT COVERS

Style "H" **\$3.89**
Only EACH

FRONT seat only—\$4.89
FULL SET—front and rear seats\$7.89

Now—not partial—but COMPLETE covers made of superb quality lacquered pulp fibre such as used only in most expensive seat covers. Genuine fibre protects the entire riding surface of backs and cushions. Special "HUG-TITE" material covers ALL facings on front and rear seats; also ENTIRE back of front seat. Attractively trimmed with harmonizing leatherette. Colorful plaid glazed and water repellent. Easy to clean. Simple to install. Just slip over upholstery. Snug fitting—smartly styled—durably constructed. Sold on ten-day MONEY BACK GUARANTEE.

SEND NO MONEY—MAIL COUPON

EMCO, 319 N. Wells, Dept. H-270 Chicago 10, Ill.
Please rush "HUG-TITE" Auto Seat Covers. (Indicate quantity and style H, J, K or M)
..... FULL SETS at \$7.89 per set
..... FRONT — FRONT..... REAR.....
..... FRONT SEATS ONLY: Style..... at \$4.89 Each.
..... STYLE "H" ONLY: at \$3.89 Each.
Car Make..... Body Style..... Year.....
☐ Also include..... pairs Fiber Door Protectors complete with fittings at \$1.00 per pair.
PLEASE PRINT—Illinois Residents add 2% State tax.

NAME.....
ADDRESS.....
CITY..... ZONE... STATE.....

INDIVIDUAL SEATS
Includes both Front Seats

J Front Seat Sedan
K DIVIDED BACK SOLID SEAT Front Seat Coach or Coupe
M 

☐ Send C.O.D. plus shipping and C. O. D. Fee.
☐ SEND POST-PAID. I enclose full payment of \$...

Do you want

→ ..to go to College?

→ ..or to enter a Profession?

(Such as Accounting, Architecture, Nursing, Dentistry, Teaching, Social Work, Osteopathy, Beauty Culture, Optometry, Embalming, Chiropody, Law, Medicine, etc.)

→ ..or get an Office Position?

To get anywhere, you practically **MUST** finish High School **FIRST**. You can complete our simplified High School Course in **SPARE** time at home, as **FAST** as your time and abilities permit. Equivalent to resident school work—prepares you for college, pre-professional examinations, business, industry. Standard texts furnished. Diploma. Credit for H.S. subjects already completed. Single subjects if desired. Low tuition, easy terms. American School, Chicago, est. 1897—endorsed by educators. Finish your high school education **NOW**. Write **TODAY!**

High School Course at Home

Many Finish in 2 Years

American School, Dept. H846, Drexel Ave. at 58th St., Chicago 37

Gentlemen: Send me **FREE** information covering special training in subjects checked below. No obligation on my part.

- | | |
|--|--|
| ☐ High School Course | ☐ Diesel Engineering |
| ☐ Electronics, Industrial | ☐ Drafting and Design for Men and Women |
| ☐ Architecture and Building | ☐ Plastics |
| ☐ Automotive Engineering | ☐ Private Secretary |
| ☐ Business Management | ☐ Mechanical Engineering |
| ☐ Electrical Engineering | ☐ Aviation |
| ☐ Elec. and Gas Refrigeration | ☐ Salesmanship |
| ☐ Air Conditioning | ☐ Radio |
| ☐ Railway Training | |

Name

Address

Learn this Profitable Profession

IN 90 DAYS AT HOME

Money-Making Career Open to Men and Women, 18 to 50

Hundreds of men and women between 18 and 50 make \$10 to \$20 in a single day giving scientific Swedish Massage and Hydro-Therapy treatments. There is big demand from doctors, hospitals, sanatoriums and clubs. Graduates earn large full time incomes from these or in private practice in their own offices. Others make good money from home treatments given in spare time. Learn this interesting, money-making profession in your own home, through our home study course. Same instructors as in our nationally known resident school. You can win independence and prepare for future security by qualifying for your Diploma. Course can be completed in 3 to 4 months. Many earn while they learn. Begin your training at once.

Anatomy Charts & Booklet FREE

Enroll now and we will include, at no extra cost, many needed supplies. Fit yourself to help meet growing demand for Scientific Swedish Massage. Send the coupon at once for complete details, Anatomy Charts and 32-Page Illustrated Booklet, **FREE**, postpaid.



THE COLLEGE OF SWEDISH MASSAGE
Dept. 870 P, 41 E. Pearson, Chicago 11

Please send me **FREE** and postpaid, Anatomy Charts, 32-page Booklet and complete details on Home Training.

Name

Address

City State

Calling all Men... STRIP-TEASE NECKTIE THAT GLOWS IN THE DARK



"SHE LOSES HER CLOTHES AS SHE GLOWS IN THE DARK"

BY DAY

Astounding new **STRIP-TEASE NECKTIE** is the latest rage from coast to coast! Spectacular new novelty tie creation for men who demand the distinctive and unusual! Brings gasps of sheer wonder, thrilling admiration the first time you wear it! **By day**, smart, handsome tie that is unrivalled for sheer beauty and extravagant good looks, **by night** a glorious goddess of light revealed for all to see! She loses her clothes as she glows in the dark! A glorious, gleaming blonde beauty revealed in daring pose in the briefest of costumes, mysterious and magnificent! Write today and if you don't agree this outstanding new necktie sensation is the most exciting tie you've ever seen—it costs you absolutely nothing.

SEND NO MONEY—

Special Introductory Offer

Send your name and address, receive startling new Strip-Tease Necktie by return mail. Pay postman just \$1.64 (3 for \$4.79) plus postage and keep 10 days. If in that time you aren't thrilled and delighted, return for money back without question! Write to

GLOW IN THE DARK TIE CO., DEPT. 454-S
215 N. MICHIGAN AVE., CHICAGO 1, ILL.



BY NIGHT

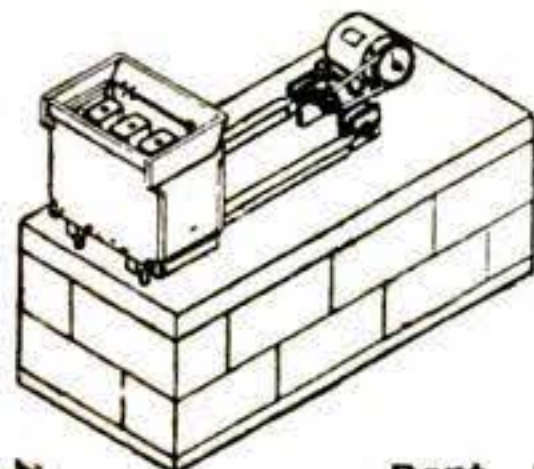
BE A REAL ESTATE BROKER PAYS BIG!

EASY TO LEARN—Start and run your own business quickly. Many graduates report making up to \$1000 a month. Course of study covers Sales, Property Management, Appraising, Loans, Mortgages and hundreds of related subjects. Course in home study or classroom instruction in leading cities. Big new illustrated catalog from this nationally known school. G. I. Approved. Send a Post Card Today.

WEAVER SCHOOL OF REAL ESTATE (Estab. 1936)
15 E. Pershing Road Dept. PC Kansas City, Mo.



BUILD THIS CONCRETE BLOCK MACHINE



Sell blocks; or build your home, garage, barn, or filling station at 1/3 cost by making and laying your own blocks.

This simple machine which you can build yourself at a cost of \$15 (excluding motor) will make a block in 30 seconds using only one form. Mass production can be achieved by a new simple method of removing blocks which allows two to four forms to one vibrator. Power driven concrete mixer plans also. Send dime for details and "How to Make and Lay Blocks" folder.

U-BUILD-IT SERVICE
Dept. 5-A, 206 West Wilder Ave., Tampa 3, Fla.

INVENTORS

HIGHEST ROYALTIES and CASH

FOR YOUR INVENTIONS
INVENTION MARKETING SERVICE "UNPARALLELED" BY ANY OTHER AGENCY IN THE WORLD
Write for **FREE** booklet without obligation

UNIVERSAL MARKETING CO.

354 South Spring St. (Suite C)

Los Angeles 13, Calif.

HYPNOTIZE ANYONE



Yes, anyone. Learn modern speed hypnotism. Secrets revealed. Self-hypnosis. Exciting experiments. Overcome inferiority complexes, smoking, alcoholism, stuttering, nailbiting, phobias, insomnia, stagefright. Improve your memory. Private & class instruction available at Institute.

Complete homestudy \$2 course

Hypnotism record album for Mass-Hypnotism and Self-Hypnosis. \$5
POWERS INSTITUTE OF HYPNOTISM, 1324 Wilshire Blvd., Dept. 44, Hollywood 14, Calif.

NOW YOU TOO CAN BUILD 15 RADIOS

COMPLETE
KIT
\$14.75



**Absolutely no Knowledge
of Radio Necessary
You Need NO Additional Parts**

The PROGRESSIVE RADIO KIT is THE ONLY COMPLETE KIT. Contains everything you need. Instruction Book, Metal Chassis, Tubes, Condensers, Resistors and all Radio parts.

The 36-Page Book written by Expert Radio Instructors teaches you to build radios in a Professional Manner. You start with a 1-tube receiver. Before you are done with this kit, you will have built 11 Receivers, 1 Public Address System and 3 Transmitters.

SPECIAL FREE OFFER!

Electrical and Radio Tester sent absolutely FREE with each Progressive Radio Kit. PLUS FREE membership in Progressive Radio Club. Entitles you to free expert advice and consultation service with licensed radio technicians.

Write for further information, or ORDER your **\$14.75** KIT NOW! ONLY

Postage prepaid with check or money order.

(Postage not prepaid with C.O.D. orders)

PROGRESSIVE ELECTRONICS CO., Dept. 102
497 Union Avenue Brooklyn 11, N. Y.

POUR GORGEOUS BOOKENDS with Magic Liquid Plastic

**"Pours like honey...
Sets like glass"**

It's easy to create exquisite bookends like the one shown... cast duplicates of hundreds of art objects with Castolite—the "magic" liquid plastic that pours cold, sets without pressure or high temperatures. Cast figurines, candlesticks, plaques...

embed photos, real flowers, butterflies, etc. Use only home utensils. No artistic ability required. Follow simple step-by-step method. New pleasure, fine profits are possible. Send 25c for exciting new Home Project Manual showing how to get started *Write today!* The Castolite Company, Dept. TM4, Box 391, Woodstock, Illinois.

MANUAL
25¢

LEARN MEAT CUTTING



through actual practice. Profitable Meat Cutting and Successful Meat Merchandising taught easily, quickly. LEARN BY DOING at Toledo in just six short weeks under actual market conditions. For beginners or men with experience. All subjects taught thoroughly and completely. Diploma. Job help. Get store of own. People must eat. School in operation over 25 years. Approved for GI training. Send today for FREE illustrated catalog. No obligation.

NATIONAL SCHOOL OF MEAT CUTTING, Dept. 51-B, Toledo 4, Ohio



POCKET RADIO

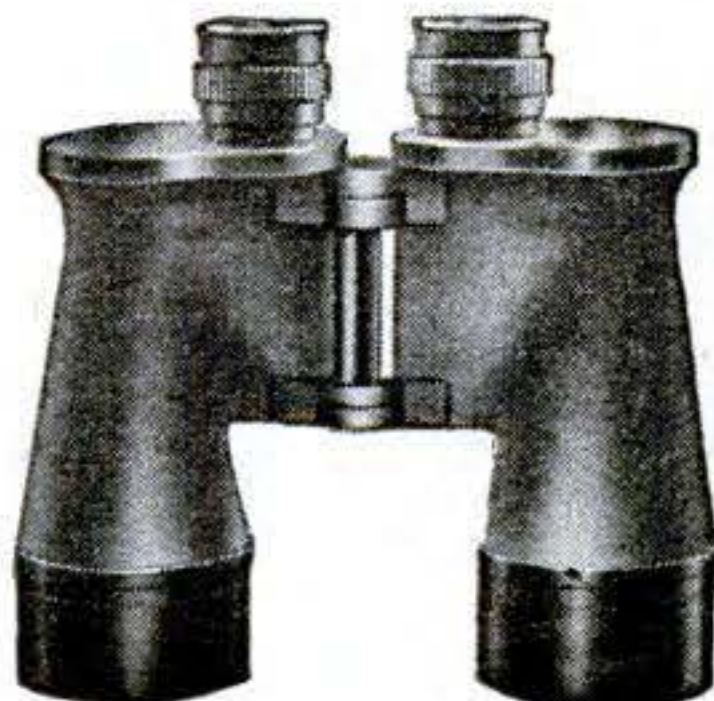
Silver plastic case—NO TUBES, BATTERIES OR ELECTRIC "PLUG-INS" NEEDED. GUARANTEED TO RECEIVE LOCAL STATIONS. Only \$3.99 (ek. mo. cash) postpaid or SEND ONLY \$1.00 and pay \$2.99 COD. COMPLETE READY TO PLAY on easy connection. GET YOUR POCKET RADIO NOW—Today!

MIDWAY SALES CO., Dept. PPS-11, Kearney, Nebr.

WAR SURPLUS OPTICAL BARGAINS

ASSEMBLE YOUR OWN BINOCULARS!

Save More Than 1/2 Regular Cost



GOVERNMENT'S 7x50 BINOCULARS

**Complete Optics!
Complete Metal Parts!**
We supply Full Instructions

METAL PARTS—Set includes all Metal Parts—completely finished—for assembly of 7 X 50 Binoculars. No machining required. Bodies have been factory hinged and covered. A sturdy Binocular Carrying Case is optional with each set of Metal Parts.

Stock #842-N \$39.40

Postpaid, plus \$4.80 for Case—Total..... \$44.20

OPTICS—Set includes all Lenses and Prisms you need for assembling 7 X 50 Binoculars. These are in excellent condition—perfect or near-perfect—and have new low reflection coating.

Stock #5102-N..... \$25.00 Postpaid
(These are standard American-made parts... not Japanese, French or German.)

NOTICE! If you buy both Binocular Optics and Binocular Metal Parts, add 20% Federal Excise Tax to above prices.

ARMY'S 6x30 BINOCULARS

COMPLETE OPTICS & METAL PARTS—Model M-13A1, 6 x 30 Binoculars (waterproof model). Everything you need—ready for assembly. When finished will look like a regular factory job costing \$102 to \$120. The Optics are new, in perfect or near-perfect condition. Have new low reflection coating. Metal Parts are new and perfect, all completely finished. No machining required. Bodies factory hinged and covered. Complete assembly instructions included.

Stock #830-N..... \$40.00 Postpaid,
plus \$8.00 tax—Total—\$48.00

20X PRISM SPOTTING SCOPE SET—Consists of all lenses and prisms (slightly chipped) you need to make a good, standard 20X Spotting Scope. Low reflection coated. 57 mm. dia. Achromatic objective. Direction sheet included.

Stock #5145-N..... \$22.00 Postpaid
(Also surplus Riflescopes—Write for Bulletin 18-N)

SLIDE PROJECTOR SETS—Consist of all unmounted lenses you need to make the following size projectors:

Stock #4038-N—2 1/4"x2 1/4"..... \$3.35 Postpaid

Stock #4039-N—2 1/2"x3 1/2"..... \$3.35 Postpaid

Stock #4029-N—35 mm..... \$2.85 Postpaid

6 POWER GALILEAN TELESCOPE—(Commercial Surplus) 28mm dia. Achromatic Objective Lens. Sturdily constructed of Aluminum. 7" long, extends to 9". Complete with carrying case.

Stock #941-N..... \$3.00 Postpaid

Announcing!

1948 Annual Gadget Contest.
IT'S FUN! IT'S EASY!
BIG CASH PRIZES for Optical Gadget IDEAS! Write
for Entry BLANK and Complete Details!

We have millions of war surplus lenses and prisms at bargain prices ranging 10c and up. Write for Catalog "N"—Sent Free!

Order by Stock No.

Satisfaction Guaranteed

EDMUND SALVAGE COMPANY

P. O. AUDUBON, NEW JERSEY

ABC OF AVIATION

Now you can own this famous work on aviation that has helped thousands of readers! Big sections on private plane maintenance and repair, what to look for in your plane, etc. Tells all about construction instruments, special uses of more than 250 aircraft, 598 pages, only \$1.98.

POPULAR SCIENCE

Dept. 118, 353 4th Ave.

New York 10, N. Y.

NOVEMBER 1948 69

A MUST FOR MECHANICS



Assembly and repair work made easy with "HOLDIT" screw holding, screw driver. Simply set blade in screw slot and push to get secure attachment: YOU'VE PUT A HANDLE ON THE SCREW. Automatically resets. SATISFACTION GUARANTEED. See your tool dealer or send to factory. Sizes: 3" \$1.00, 6" \$1.15, 9" \$1.25. Send check or money order... sorry no COD's. DEALERS WANTED.

"HOLDIT" Box 235, San Lorenzo, California

IT'S **EASY** TO LEARN **DRAFTING**

STUDY AT HOME IN SPARE TIME



Draftsmen are Secure, Well Paid

C.E.I. methods of teaching are practical and effective, yet simple and thorough. Why—because you learn by doing. Every student receives **FREE** a complete set of high quality drafting instruments—the kind professional draftsmen use. Right away you begin to work at the board. Everything you study is practical. Prepare yourself for a secure, good paying job in drafting. You, too, can learn in your spare time, just as hundreds of others have. Get the facts today.

Charles N. Zelenko
Director, C.E.I.

**MAIL
NOW!
FREE
BOOK**

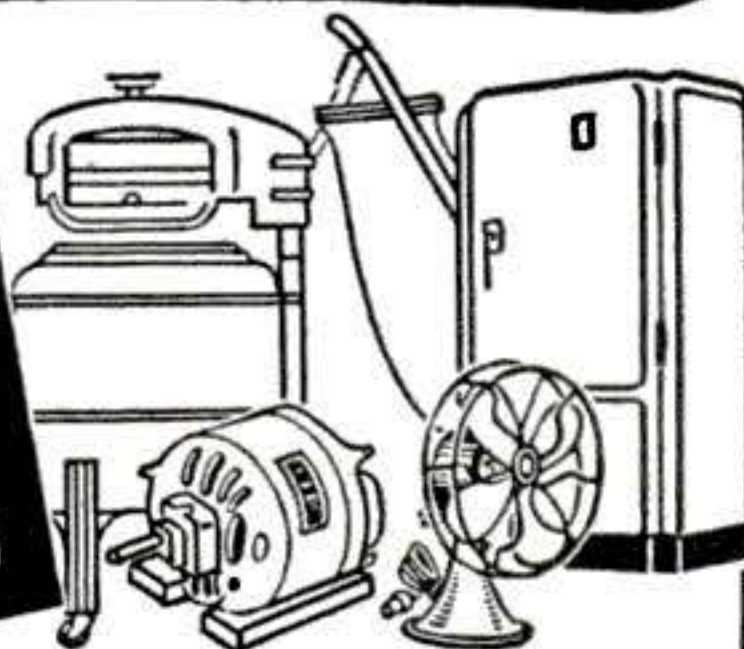
Cleveland Engineering Institute
PS-11 2325 Chester Avenue, Cleveland 14, Ohio
Send me a **FREE** drafting lesson and your Success Book, showing opportunities in drafting.

NAME.....
ADDRESS.....
CITY.....STATE.....
Hrs. you work.....
Vet. ☐ Non Vet. ☐
No obligation



**HERE'S A NEW AND
VITAL BUSINESS!**

**LEARN
ELECTRICAL
APPLIANCE
REPAIRING**



**APPLIANCE REPAIRMEN USUALLY CHARGE
ON BASIS OF \$5.00 TO \$6.00 PER HOUR**

This fascinating big money making opportunity can be yours if you are mechanically inclined (can hold and use tools). Act. Now!

NO PREVIOUS EXPERIENCE NEEDED!

Think of going to a friend's or your neighbor's home. Picking up and carrying back to your work bench their Sewing Machine, Vacuum Cleaner, Iron, or other appliance. Then using your Christy Course and Christy Electronic Kit to help you locate the trouble and easily repairing the appliance from the clear instructions given. I will help you . . . by showing you exactly how much **PROFIT** to charge for each repair job.

CHRISTY APPLIANCE COURSE & ELECTRONIC KIT . . . SENT TO YOU!

Rush your name and address by the next mail and I will send to you our special form where you can get our complete course and electronic kit on our simple, easy payment plan. Pay me later with your **EARNINGS WHILE LEARNING**.

Mr. S. T. Christensen, Pres.
CHRISTY SUPPLY CO.

2835 N. Central Ave., Dept. D-7101, Chicago 34, Ill.

Phenomenal Value • Treasured Lifetime Gift

INCABLOC
Shock
Resistant
Feature

17 JEWEL • 2 PUSH BUTTON
CHRONOGRAPH

\$29.75
plus
10% tax

(formerly
\$71.50)

"4-in-1" Precision Instrument
• WRIST WATCH • TELEMETER
• STOP WATCH • TACHOMETER

Sweep second hand • Anti-magnetic • Radium dial
Stainless steel back • Unbreakable crystal. **IDEAL** for use in sports, sciences, engineering, medicine, photography, radio, aviation.

OUR FAMOUS
GUARANTEE
MONEY BACK
in 10 DAYS
If not satisfied
for any reason



Also
available
in 18K
Gold Case
\$64.50
plus 10% tax
(formerly \$125)

Mail orders promptly
filled. Shipped C.O.D.
or send check or money
order. Address all mail orders
to: **ADLEW JEWELERS**,
152 W. 42 St. N.Y. 18 (Dept. 116)

**Adlew
JEWELERS**
117 W. 42nd St., New York 18

CARBURETOR TOO RICH MAKES MOTORIST TOO POOR



Car owners who are wasting money and not getting proper gas mileage due to over-rich mixtures will be pleased to learn how to save gasoline by **VACU-MATING** over-rich mixtures. **VACU-MATIC** fits all cars, trucks and tractors. It is automatic and operates on the supercharge principle. Easily installed in a few minutes.

SALESMEN WANTED! Big Profits!

Send name, address on penny postcard for free particulars and how to get yours for introducing.

VACU-MATIC CO., 7617-1405 W. State St., WAUWATOSA, WIS.

MONEY for MEN ALL DATA FREE

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands. Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. 1/2c material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. Big chain store orders now being placed. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N. Y.



WHY PAY MORE?

Tube Given With Every Tire

YOU GET WHAT WE ADVERTISE
SEND THIS AD WITH ORDER

Slightly used **HIGH ORIGINAL TREADS**. Buy in **CONFIDENCE**. Safe! Dependable! Standard Brands. **GUARANTEED** to give A-1 SERVICE. **Positively Not Re-caps!**

600-16	\$4.45	700-15	\$4.25
650-15	4.25	700-16	4.95
650-16	4.45	750-16	6.45

NOT JUST GOOD BUT THE "BEST"

600-16	\$5.55	700-15	\$5.55
650-15	5.15	700-16	6.55
650-16	5.55	750-16	7.15
900-16	\$ 7.95	900-20	\$14.55
650-20	9.45	1000-20	14.55
700-20	10.75	1100-20	15.55
750-20 (H.D.)	11.45	32x6 (8)	10.85
825-20	13.85	32x6 (10)	12.15

750-20 MILITARY 8 PLY..... \$9.85

Thousands of tires shipped to satisfied customers. Trial will convince you. Send Money Order or Check. One of Philadelphia's Oldest

STANDARD TIRE

834 N. Broad St. Phila. 30, PA.



WINDMILL-RAINBOW-FLASHER SPINNING AUTO LIGHT

Spins with the wind. The most beautiful light in the world. Red, White & Blue. Everybody wants one. Spins 2,000 times per minute. Easily put on Auto, Motorcycle, Airplane or Boat. Pay mailman \$2 plus postage or send \$2 and we pay postage. Be first. Agents wanted.

SPIN LIGHT CO.

373 B. Belmont Ave. Paterson 2, N. J.

Patented



PRECISION MADE SWISS WATCH SPECIALLY PRICED \$23.75 FULLY GUARANTEED

For sportsmen, men who like activity, this watch can really take it! The 17 jewel Swiss movement is a model of accuracy. Chrome case with a stainless steel back. Absolutely waterproof, shockproof and anti-magnetic. Radium dial that glows in the dark and a sweep-second hand for perfect visibility. **FREE Bonus for Promptness!** A fine stainless steel expansion band to match this watch. Order yours early! Send no money. Pay postman upon delivery. Satisfaction guaranteed or money back.

Send today for FREE illustrated booklet.

REGISTERED JEWELERS

1721 1/2 Canal St., Dept. PS-11, New York 13, N. Y.

FEET HURT?

TRY DR. BARRON'S NEW FOOT CUSHION for fast relief where it hurts: 1—Corns. 2—Metatarsal Callouses. 3—Weak Arches. 4—Sore Heels. **LIKE WALKING ON A PILLOW!** Light. Spongy. Ventilated. Fits all shoes. Cushions arches and feet, heel to toes. Dr. Barron says: "Wonderful for aching feet!" Send \$1.98 for A PAIR, or C.O.D. plus postage. State shoe size, if man or woman. **30-DAY TRIAL GUARANTEE.** Money back if no blessed relief.



ORTHO, INC., Dept. 48-P, 2700 Broadway, N. Y. C. 25

POWERFUL BINOCULARS

only 2⁹⁸

Quality plus—yet priced to beat all competition. All metal with adjustable focusing wheel and shoulder strap. Tubes extend for sharp, instant view of distant objects. **SEND NO MONEY!** Clip ad and mail. We'll ship C.O.D. Check here to get handsome Carry Case only 50c extra. **Illinois Merchandise Mart, Dept. 2224B**
1227 Loyola Ave., Chicago 26, Ill.



ITALIAN ACCORDIONS



All types, all models. Very best. Hand Made. Lowest prices. Buy direct from Factory representative and Save Money. Also Button Accordions. Chromatic Accordions and Concertinas. Send name and Address for FREE catalog.

ITALIAN ACCORDION MFG. CO.

7600 Cottage Grove Ave., Dept. PS-11, Chicago 19, Ill.



BAR BELLS

Buy Direct From Factory
Save 20% to 30%

\$8⁹⁵
up

Write for Free Booklet
and Price List

INDEPENDENT IRON WORKS

2416 EAST 23RD STREET, DEPT. C
LOS ANGELES, CALIFORNIA



LATEST MODELS

- Beautiful nickel plated case
- Guaranteed by famous factory
- Adjusted for dependable accuracy
- Assorted cases and dials
- Unbreakable glass

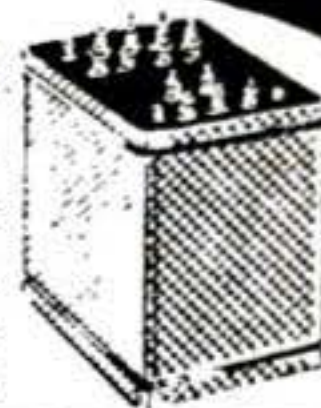
GIVEN without extra charge genuine rabbit's foot and chain, well known symbol of good luck. Rush order today and pay on delivery \$3.83 plus tax and shipping charges or enclose remittance and save charges.

ROLDEX, Dept. W-23, P.O. Box 45, Huntington, N. Y.

WAR SURPLUS AND OTHER BARGAINS

TRANSFORMER

Jefferson Electric step up or step down transformer. Input, primary 110-117 Volts A.C. Output, from 5 Volts to 650 Volts. Suitable for use with war surplus gadgets, heater relays, radio test filaments, electric trains, house chimes, etc. Weight 10 lbs. New \$7.95 Each



SEND CHECK, MONEY ORDER or CASH

FANCY BRIAR PIPES

We have been awarded 100,000 fancy briar pipes by Quartermaster Corps. Assorted shapes and sizes. All popular makes. Buy now for Christmas Gifts Set of 7, \$3.50



MICROMETER



Chrome plated, precision engineered and carefully tooled to give long life ...

all new. 0-1" capacity, \$2.25.
1-2" capacity, \$3.50 Each.

WILLARD WET PLATE BATTERY



This extra long life rechargeable battery is ideal for portable radios, mobile units, bell circuits, alarm systems, rural telephones, Strobo bulbs, etc. 2 V 20 Amps. Only 5" high. Visible ball float hydrometer built in Lucite case. Shipped dry. Any battery service will supply standard battery electrolyte. Used singly or in multiples. Shipping Wgt. 3 1/2 Lbs. All new. \$2.75 each

25% DEPOSIT REQUIRED ON C.O.D. ORDERS



WEATHERSTRIPPING ADHESIVE FELT—

Dutch Brand, made by Van Cleef Bros. 3/4" wide, 3/16" thick. Adheres with strong grip to any surface in any climate. No nailing required. 101 different uses, in aircraft, autos, boats, trailers, etc. Linen backed. 50 Ft. Rolls \$1.50 per roll

MICROSWITCH



Type Z - 2" x 1" x 1/2". Used open or closed. For automatic contacting-light, sound, model train systems, chimes, etc. New.....3 for \$1.

ALL PRICES F.O.B. CULVER CITY, CALIF.

4 in 1 SCREWDRIVER:



3 smaller sizes fit into 6" overall size. Fine steel bits. Solid brass handles. All New. Each \$1.

HIGH SPEED DRILL BITS



Like new! Original value over \$16.00. 25 assorted sizes & lengths \$2.50.

CLAMPS—Adel Aluminum Co., Rubber lined, hundreds of uses in any shop. Assorted sizes, all new 5 Doz. \$1 — 500 \$5

AIRBORNE SALES CO., INC. DEPT. PSM 11-8, CULVER CITY, CALIF.

Say You Saw
It In Popular Science

FIREWORKS

CHINESE FIRE CRACKERS

1 Bundle or 1280—1 1/2" Crackers..... \$2.50
1 Bundle or 1600—1 1/2" Crackers..... 3.00
8 Bundles to a case

BALLOONS—LATEX RUBBER

No. K 8, per gross..... \$1.00
No. K 10, per gross..... 1.15
No. K 20, per gross..... 2.40

Wholesale only. Send Remittance with Order.

UNITED FIREWORKS MFG. CO., INC.

Dayton 7, Ohio

NO SHOP
NEEDED

Operate YOUR OWN Business



Clean and Mothproof Rugs and Upholstery

Can you qualify? . . . If you are dependable, honest and willing to work, send for FREE Booklet explaining how you can become "your own boss" in a growing business of your own. You'll use proven successful methods of established DURACLEAN Dealers. Service rendered "in the home," offices and public buildings. Easy to learn.

DURACLEAN cleans by absorption! No scrubbing. No soaking or shrinkage. Fabrics dry in just a few hours. Dirt, grease and many unsightly spots vanish as if by magic . . . colors revive. Upholstery and floor coverings last longer.

DURAPROOF kills moths and carpet beetles. Makes material resistant to both! Another year 'round service. DURAPROOF, to our knowledge, is the only moth proof service backed by a National Money Back, 4 YEAR WARRANTY. Guards against mildew, too.

These services are Nationally Advertised! Leading furniture and department stores recommend DURACLEAN Dealer's service. Almost every building in your territory houses a potential customer. Even auto dealers buy your service to revive upholstery in used cars.

Some dealers establish a shop or an office after business has grown. Others continue to operate from their own home. Profits up to \$15 and \$20 for a day's service on EACH of your service men.

Territories are limited! Write now for FREE Booklet and Easy Terms.

See our full page "ad" in September House & Garden.

DURACLEAN CO. 18-NCT., DEERFIELD, ILLINOIS

Learn How to HYPNOTIZE!



Develop your personal POWER! NOW . . . revealed for you . . . are the secrets of **practical hypnotism** . . . that strange, compelling force by which an expert operator can bring others under his power. He can **sway** people at will—issue commands and be obeyed—virtually cast a **spell** over his subjects. This sensational knowledge may make you a more dominant, masterful personality.

Illustrated SELF-INSTRUCTION COURSE in Useful Hypnotism

Amazing lessons in simple, easy-to-understand language. How to select a subject—how to hypnotize by telephone—**how to make money** from hypnotism—mental telepathy—stage hypnotism—self-hypnosis—how to use **modern hypnotism** to conquer inferiority complex, timidity, etc. Clear helpful pictures show operating positions, movements. **Startling low price.** Satisfaction guaranteed or money back.

ONLY \$1.95

SEND NO MONEY! Simply pay postman \$1.95 plus C. O. D. postage or send \$1.95 and we pay postage; same money-back guarantee. Order "Hypnotism Course" today! Nelson-Hall Co., 1139 S. Wabash Avenue, Dept. 2L01, Chicago 5, Illinois.

SEND FOR FREE CATALOG!

Out of Pawn!

GENUINE DIAMONDS



Direct to You—Save up to 50% and more on fine quality, Genuine Diamonds, reset in beautiful modern mountings, styled for Ladies and Men—Sold with an Iron-Clad Money-Back Guarantee. Over 100,000 satisfied customers. Order now from this ad. Write us for FREE ILLUSTRATED CATALOG of other Unredeemed Diamond Pledges from \$5.00 to \$5000. Send today. Reference: Any Bank or any Mercantile Agency.

1/5 CARAT
\$125 Value

\$49
Tax incl.

1/2 CARAT
\$200 Value

\$95
Tax incl.

BERMAN'S COLLATERAL LOAN BANK

Dept. PS- 636-38 W. Balto. St.,

Baltimore 1, Md.

WINDOW SIGN LETTERS GENUINE GOLD LEAF

Guaranteed not to tarnish or fade. For store fronts & office windows. Anyone can put them on. These letters are made of tinfoil, and applied with a varnish cement.

SAMPLES FREE

METALLIC LETTER COMPANY, 429 N. Clark St., Chicago



SEND FOR FREE FOLDER

MULTI PURPOSE POWER TOOL

Magna Engineering Corporation
465 California St., San Francisco 4



"POCKET TALKIE" AS LOW AS \$9.95

REALLY WORKS—talk and hear 2-10 miles or more—FITS IN YOUR POCKET! Uses flashlight batteries. ABOUT SIZE OF 2 PACKS CIGARETTES! Wt. 1 LB!

SEND ONLY \$1.00 (cash, check or MO) or pay postman \$1.52 C.O.D. for photos, picture blueprints, instruction book, parts price list with DETAILED CATALOGUE ON 135 OTHER PRODUCTS SUCH AS: (\$1.00 allowed on parts order)

3-tube Pocket Radio, Cigar Box Transmitter, Dash Car Transmitter, Radio Garage Door Openers!

MOTOR INDUSTRIES CO., Dept. PW-11, Kearney, Nebr.

Make INSTA-CHANGE Fluorescent Ad Signs in 2 Minutes with Magic "Press-on" Letters

**"GOLD MINE" FOR MEN WHO CALL ON
STORES, RESTAURANTS, TAVERNS, etc.**

FREE! Actual sample **Free**—Mysterious Stick on—any place you put them! Get amazing INSTA-CHANGE Display Sign Demonstrator. Show America's most spectacular Fluorescent Display Sign to business men in your territory and cash in on a flood of **BIG-PROFIT** orders! IT'S TERRIFIC!

Anyone can make up a complete new sign in just **2 minutes!** Merchants save hundreds of dollars on sign writing bills. Be first in your territory. Rush coupon today for facts about Demonstrator, and actual sample of mystifying "MAGIC LETTERS"—all **FREE!**

**FREE
SAMPLES**

MAXILUME CO., 125 W. Hubbard St., Dept. 911, Chicago 10, Ill.

**MAGIC LETTERS
STAY WHERE
YOU PRESS'EM**

**FREE
SAMPLE**

**MAXILUME CO., Dept. 911,
125 W. HUBBARD STREET • CHICAGO 10, ILLINOIS**
Rush actual sample of Mysterious INSTA-CHANGE Sign "MAGIC LETTERS" and complete selling kit **absolutely FREE.** No cost to me, now or ever.

Name _____

Address _____

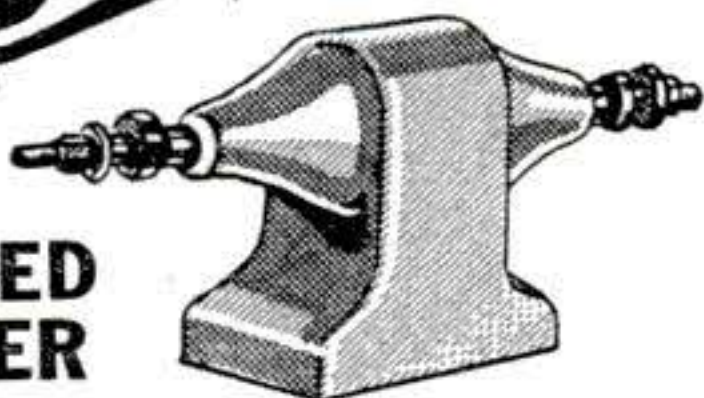
City _____ Zone _____ State _____



Here are Real **WAR SURPLUS BARGAINS!**



HI-SPEED GRINDER



Heavy duty, ball bearing with heavy aluminum casting. 2 step pulley driven thru the rear or base. Precision spindle. 17" long by 1/2" or 5/8" shaft (specify size desired). 6" from base to center of spindle. Ship. **\$1395** Wt. 12 lbs. Stock #328. NEW. Only

BALL BEARING ARBOR



Grinding and saw arbor. Has 1/2" double end shaft, 10" long with 2" center pulley. New Departure double roll precision aircraft ball bearings. Right and left hand thread. Self-aligning Dodge pillow block. 10,000 R.P.M. Bearings alone list at \$10.00. Complete **\$495** arbor. Stock #305. NEW. Only

DELUXE version of above arbor—has 2 and 3 inch center step pulley and 2 1/2" heavy cast aluminum pillow block. Stock #306. **\$695** NEW

ELECTRIC RUBBER CABLE (all new) CORD SETS



Extension cords, 100 ft. heavy duty. Plug, socket and guard. Number 16 wire. Worth at least \$10. Stock #310. **\$535** OUR PRICE

Same as above — 50 ft. **\$385** length. Stock #311. Only

Heavy Duty Electric Cable

3 wire #10 submarine cable and lugs—can be placed underwater, underground or overhead. Also for portable tools. Will carry 40 amps. Stock #312.

50 ft.	100 ft.	250 ft.	500 ft.
\$12.00	\$20.00	\$45.00	\$85.00

RUBBER CABLE

150 ft. reels, 3 wire #6 with 4, 60 amp Crouse & Hines connectors—2 male & 2 female. Perfect for welders, car loaders, saws, electric ranges, etc. List price \$190.00 per reel. Stock #313. **\$6500** OUR PRICE

U. S. Surplus Horns and Howlers



Motor driven. (not a vibrator). Heavy duty with great power and long life. Adjustable for high, medium or low tone. 110 volt AC current. Weather proof. For alarm or signal horn on boats, school yards, factories, etc. List price \$47.00. NEW. Stock #302. **\$945** PRICE

9 ft. of cord & switch for horn. **\$1.00**

ROTARY PUMP



Heavy duty. designed to pump water, oil, gasoline, etc. Will pump 35 gal. per min. Also used as a vacuum pump. 3/4" outlet and inlet on bottom. Dimensions: 7 1/2"W x 5"D x 7"H. Compact and sturdy. Four mounting holes in base. Can be used with 1/4, 1/8, or 1/2 HP motors. Ship. Wt. 17 lbs. NEW. Stock #325. **\$1695** Only

JARVIS GRINDERS



2 HP, 60 cycle, 220-440 volt. 3450 RPM. Totally enclosed G.E. motor with shaft. List price \$250.00. Used— **\$7500** like new. Stock #326. Only

HOT WATER MERCURY ACROSTAT

Keeps your hot water at any temperature you want. Can be set for 160 to 220. Any handy man can easily install it on your water heater. Mfg. by White-Rogers, type 1190 size 8. Fits 1/2" pipe thread. 25 amps, 110 volt AC-DC, 15 amps 220 volt AC. List price \$12.00. NEW in **\$295** original box. Stock #327. Only



AC ARMY LIGHT PLANTS

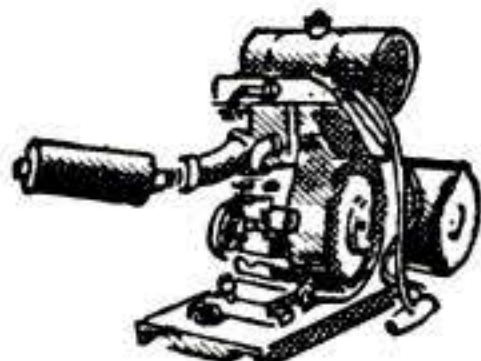


New 750 watt 110 volt. 60 cycle light plant with Briggs-Stratton model AP gas engine. Stock #315. **\$13500**

New 1000 watt 110 volt. 60 cycle light plant with Briggs-Stratton model BP gas engine. Stock #316. **\$16500**

New 2500 watt 110 volt. 60 cycle light plant with Briggs-Stratton model Z 6 HP gas engine. Stock #317. **\$24500**

Rebuilt 5000 watt 110 volt. 60 cy. light plant with automatic remote control. Powered by Jeep 4 cyl. gas engine. Rebuilt like new and guaranteed. Stock #318. **\$62500**



10,000 watt 110 and 220 volt. 60 cy. light plant with automatic remote control. Powered by Jeep 4 cyl. gas engine. Rebuilt like new and guaranteed. Stock #319. **\$72500**

PORTABLE DC LIGHT PLANT

3000 watt 110 volt DC powered by new 6 HP Briggs-Stratton model ZGP gas engine. Rebuilt generator. Generator alone lists at \$243.00. Has volt meter, rheostat, 4 female plugs, and ball bearing 2.75 x 10 rubber wheels. Guaranteed. Stock #320. **\$16500** only

GENERATORS

DC—3000 watt, 110 volt. Has voltmeter, rheostat & 4 female plugs. Lists at \$343. Stock #321. **\$6000** OUR PRICE



AC—750 watt 110 volt 60 cy. with voltmeter, rheostat, 3/4" shaft. Dimensions: 9"H x 12"W x 13"L. Wt. 52 lbs. Shielded to prevent radio interference. Mfg. by Elcor. \$125.00 value. NEW. Stock #322. **\$4950** OUR PRICE

DC—300 watt, 12 volt, 2900 RPM. Heavy duty, with current cut-out relay, high and low switch. 30 amp meter, charge and discharge. Mfg. for the Army by the Marathon Elect. Co. Can be used for boats, trucks, tractors, light plant, wind mills, etc. 3/4 HP gas or 1/2 HP electric motor will drive it. Sleeve bearings. Dimensions: 11 1/2"L x 10 1/2"W x 7"H. Base holes 4 3/4" long, 6" wide. Can be bought less shaft and base to be used direct mounted to Briggs-Stratton 1 HP engine. NEW. **\$700** Stock #323

Complete with base, shaft and bearing. NEW. Stock #324. **\$1595**

ALL ITEMS GUARANTEED TO BE AS ADVERTISED

Order at once!

Surplus merchandise is subject to prior sale.

All prices F.O.B. Milwaukee. 25% deposit required on all C.O.D. orders. No C.O.D.'s. under \$10.00. Use stock number when ordering. Many other bargain items not listed—write for our free circulars.

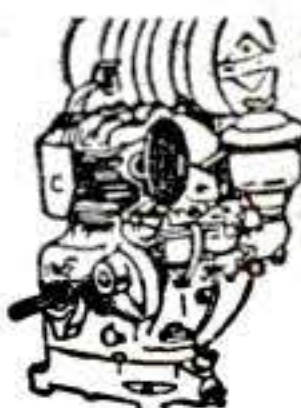
C & H ELECTRIC COMPANY

CLARK & HENKE, Owners
Dept. S-11, 436 W. Juneau Ave.
MILWAUKEE 3 WISCONSIN

BRIGGS-STRATTON GAS ENGINES

Save \$25.00

Rope start, 1750 RPM. All brand new and guaranteed. 2 1/2 HP model AP. List price \$102.10. Stock #307. **\$7700** OUR PRICE

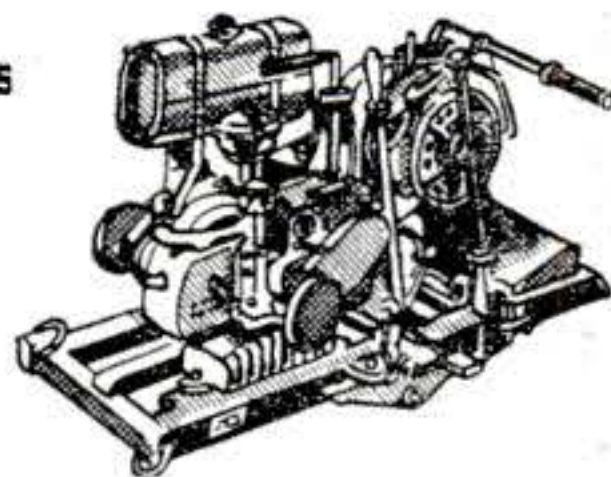


3 1/2 HP model BP. List price \$111.50. Stock #308. **\$8600** OUR PRICE

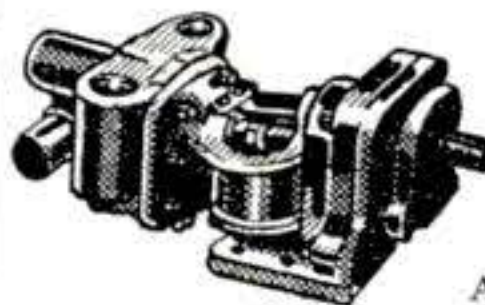
5 to 7 HP model ZGP. List price \$137.00. Stock #309. **\$10200** OUR PRICE

POWER WINCH

Ideal for
CONTRACTORS
FARMERS
ELEVATORS
MOVERS
RR CAR
MOVERS
WELL
DRILLERS
MINES, ETC.



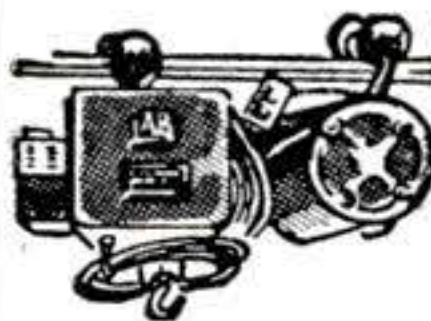
New 2 cyl. gasoline driven hoists, powered by 11 HP, 2 cyl. Waukesha air cooled gas engine. Gear shift, 2 speed with twin disc clutch, throttle and hydraulic brake. Capacity on single line approx. 4,000 lbs. Dimensions: 36"W x 60"L x 36"H. Mfg. Benson Winch Co. Comes with complete repair kit tools and box. Can also be used as a hand winch. In original crate. NEW. Stock #303. **\$32500** Only



ALL BRONZE GEAR PUMP

All bronze corrosion resistant gear pump. Will lift water 25 ft. Will deliver 1020 gal. per hour at 1200 RPM. Develops 110 lbs. pressure or 250 ft. head. Self-locking packing nuts, drain cock, reversible head. Will pump brine, salt water, oil, vinegar, gasoline, etc. Dimensions: 10"L x 7"H x 5 1/2"W. Base holes 1 3/4" x 3". Shaft 1 1/16". 1" x 1" inlet and outlet. Wt. 24 lbs. Mfg. by Sherwood Brass Works. Requires 1/2 to 3 HP motor. **\$2495** \$80 value. NEW. Stock #314. Only

Electro-lift HOIST



500 lb. Electro-lift Hoist. 17 ft. of cable — up and down button and trolley. 3 phase. 220 or 440 volt, 60 cycle. Used in A-1 shape. List price \$185.00. Stock #301. **\$7500** OUR PRICE

Specify 220 or 440 volt

HEAVY DUTY WAGON



Not war surplus—not a toy. We've built a few of them which met with enthusiastic approval. Body 25" x 45", sides 6" high—double the cubic ft. of the average coaster. Ball bearing wheels with 2.75 x 10 Goodrich tires and 3/4" axle. Will carry 800 newspapers or other large load. Can be used by newsboys, grocers, factories, etc. Built to last for years. Test load 1400 lbs. Nothing like it now on the market—Write for our circular.



PORTABLE Air Compressor

Hand truck job with Quincy 1 cyl. compressor, 4 gal. tank, automatic pressure switch, pop-off drain, stop cock, 25 ft. hose, blow gun, "V" drive, air gauge, 25 ft. cord, 10" ball bearing puncture proof Goodrich Silvertown tires, 75 lb. pressure, 1/2 HP electric motor. NEW. Stock #304. **\$12500** Only



AUTO

BOOKS ON APPROVAL



CAN YOU FIX IT?

These wonder books tell step by step HOW to make difficult repairs and adjustments, how to keep a car at maximum efficiency, including latest improvements in car design and operation. Engine troubles and how to correct them well covered.

4 BIG, THICK VOLUMES
Over 2700 pages, 2000 illustrations, wiring diagrams, etc., including Diesel engines. Beautiful modernistic, washable cloth binding.

AMERICAN TECHNICAL SOCIETY, Dept. A820
Drexel Ave. at 58th St., Chicago 37, Ill.

I would like to examine your 4 Volume Set of Auto Books. I will pay the delivery charges only, but if I choose I may return them express collect. If after 10 days' use I prefer to keep them, I will send you \$2 and pay the balance at the rate of only \$3 a month until \$24.80 has been paid. Include consulting service as offered above.

Name.....
Address.....
City..... State.....
Please attach letter stating age, occupation, employer's name and address, and name and address of at least one business man as reference. Men in service, also please give home address.

SEND NO MONEY. Just mail the coupon for a complete set of 4 Big, Thick Auto Books. 20th Edition. Over 2700 Pages! Whether you are a mechanic or helper, expert or apprentice, auto owner or driver, take immediate advantage of this **FREE EXAMINATION OFFER.**

MAKE GOOD MONEY NOW HOLD A PERMANENT JOB

America wants its automobiles kept in good repair. Men with "know how" are in demand, at big pay. These books will help you get and hold an important job, or give you a chance to go into business for yourself now or later. Any man who half tries to improve himself can learn auto servicing and repairing by this quick reference method. Use the **JIFFY INDEX** to find easily understood answer to any auto problem. These wonder books prepared by eleven of America's great automobile engineers. Many hundreds of valuable illustrations. Send the coupon **TODAY.**

[A year's consulting privileges with our engineers now given with these books without extra charge.]

Publishers Since 1898

Draw Your Way to Happiness-



ART FOR PLEASURE AND PROFIT

Learn to Draw in Spare Time—At Home!
TRAINED ARTISTS are capable of earning **\$60, \$75 AND MORE A WEEK**

Prepare yourself for a pleasant, profitable Art career. **COMMERCIAL ART, DESIGNING, CARTOONING**—all in one complete home study course. Enjoy a career with no age or physical limitations. Many pleasant art positions available in this great field. You can become your own boss, work at home and on your own time. Many students earn extra money while learning by making Posters, simple commercial drawings, lettering, etc. **W. S. A.** is now in its 34th successful year of training men and women. No previous art experience necessary, we teach you step-by-step and prepare you for good jobs. **TWO ART OUTFITS** and other features included with training. Write for **FREE BOOK**, "Art for Pleasure & Profit"—tells about our course, instruction service and commercial opportunities for you.

APPROVED FOR VETERANS UNDER G. I. BILL

FREE BOOK gives details



Washington School of Art, Studio 1311M
1115—15th St., N.W., Washington 5, D. C.
Please send me full information and your Free Book, "Art for Pleasure and Profit."

Name..... AGE.....
Street.....
City..... Zone..... State.....
☐ I am entitled to training under the GI Bill

RADIOMEN!!

Looking for Coils, Transformers, Wire, Key, Resistors, Condensers, Chassis, Hardware, etc., etc.??? You'll find 'em all in Leotone's new "Jumbo Radio Parts Kit"—17 Full Pounds of new & dismantled radio & electronic parts. Shpg. wt. 21 lbs. for **ONLY**..... **2.95**

CRYSTAL MICROPHONE. Sensitive diaphragm type. Small size (1 3/4" O.D. 1/4" deep) ideal for **Regular Lapel or Contact Mike**, or as **Pillow Speaker**. Rubber shock-mtd. metal frame. Less housing..... **.98**

PULLEY ASSORTMENT of 10 popular types (5/8" to 2 3/4" O.D.) for numerous mechanical uses. Brass, steel, etc. Shpg. wt. 2 lbs. Kit of 10..... **1.25**

RADIO HARDWARE TREASURE. A value-packed assortment of approx. 1000 screws, nuts, washers, lugs, etc., (Shpg. wt. 2 lbs.)..... **.49**

HEARING AID AMPLIFIER ASSEMBLY. (Sonotone vacuum tube type) Make a Real Vest Pocket Radio or Amplifier adding only small tuner sect. & speaker or phone. Ready-wired miniature components include: controls, transformer, choke, switch, resistors, condensers, etc. Overall Only 2"x1 1/2"x5"—Weights 3 1/2 ozs.! Less tubes & case. Complete with Diagrams for 2 or 3 TUBE SET..... **2.49**

MINIATURE ALNICO V MAGNETIC SPEAKER. High fidelity dynamic unit, for use with above Hearing Aid Amplifier as PM or **Pillow Speaker**. Also makes fine Dynamic or Contact Mike. 3/4" O.D., 1/2" deep. **NOW ONLY**..... **.39**

DOUBLE OPEN-END WRENCH—1" & 15/16". "Williams" forged steel. 10" long. Shpg. wt. 2 lbs..... **.39**

Min. order \$1.00

20% Deposit Req. on COD's

Please add sufficient postage.

67 DAY ST., N. Y. 7, N. Y.

LEOTONE

WORLD'S MOST POWERFUL

Completely Different
Than Any Other!

HY-SCORE

AIR PISTOL

Famed HY-SCORE used by experts. Expensively made. Looks and feels like a Luger. Revolutionary mechanism blasts pellets at close-to-firearm speed. **EXTREMELY ACCURATE.** Cal. .177 or .22. \$19.85 including free 500 HY-SCORE pellets (pellet value \$1.49 for cal. .177, \$1.88 for cal. .22). Also sample dart.

If your dealer cannot supply, write for free booklet, Dept. PS-11

HY-SCORE ARMS CORP.

BROOKLYN 1, N. Y.



SAVE on High Quality GABARDINE Dress Trousers

WARM FOR WINTER

Huge direct-to-you volume enables us to give exceptional value! Fully guaranteed. Genuine virgin wool and fine-spun rayon blended. Warm. Twill weave resists wrinkles, holds crease, gives amazing wear. Expert fashion tailored for perfect fit. Zipper front. Roomy pockets. Blue, Tan, Sand, Lt. or Dk. Brown, Blue-Gray. **WAIST:** 28-38 pleated or 28-50 plain.

SEND ONLY \$1 with name, waist size, 1st and 2nd color selection. Pay post-man balance plus C.O.D. Or, send entire amount, save C.O.D. Money back within 10 days if you're not pleased.

LINCOLN TAILORS

Dept. PS-11
Lincoln, Nebr.

\$12.50
VALUE

**\$7.95
PR.**

BE YOUR OWN BOSS

Profitable part or full time selling job with 65 year-old calendar and novelty manufacturer. Straight commissions from 17 1/2 to 25%. Lots of repeat business. New lines ready Dec. 1st. Write immediately to

MERCHANTS PUBLISHING CO.

Dept. PS

Remington Building

Kalamazoo, Mich.

NOW! FOR YOUR FUN OR PROFIT



TWO DOTS MAKE LETTER "i"



LEARN CODE

AMAZING, SIMPLE MEMORY METHOD

Complete Alphabet in 6-Lesson Home-Study Course

All for \$1 **OTTO LUTHER, Dept. P, NEW PRESTON, CONN.**



Learn BUILDING

AT HOME • All Blue Print Building Plans, Specifications, Lessons Furnished

FIND OUT ABOUT TRAINING AND OPPORTUNITIES FOR YOU IN BUILDING

Established in 1904, Chicago Technical College offers you thorough, practical training in Building, by home-study. Mail coupon for free information. See what this Course has done for others, what it can do for you. Read what Chicago Tech graduates say about their work, earnings, success. Learn the rewards awaiting you as a trained builder—and how quickly, easily you can get started. Simply MAIL COUPON TODAY in an envelope or paste on a penny postcard.



**CHICAGO
TECHNICAL COLLEGE**
P-158, Tech Building, 2000 South Michigan Ave.
Chicago 16, Illinois

MAIL COUPON NOW

CHICAGO TECHNICAL COLLEGE
P-158 Tech Bldg., 2000 S. Michigan Ave.,
Chicago 16, Illinois

Mail me FREE building Lesson with information about big opportunities in BUILDING and how I can train at home.

Name.....Age.....

Address.....

City.....Zone.....State.....

GET INTO BUSINESS for YOURSELF
meet the demand for...
Metalized **BABY SHOES**
...in your own home in spare time

WE HELP YOU • STEP BY STEP!

- HOW TO START
- HOW TO BRING THE BUSINESS
- HOW TO METALIZE THE WARNER WAY
- HOW TO PYRAMID PROFITS

This is a lifetime opportunity! No matter what you're doing now, you can get set for the future while beating today's high cost of living. Our plan offers everything you need to know . . . a completely charted path to personal independence — with your home as your "factory."

This tested and proved plan is working right now. Backed by an old company, it's sent to you on a No-Risk Trial, Money-Back Guarantee! The exclusive Warner Method applies an actual coat of pure metal, in genuine Gold, Silver or Bronze finish, "Eternalizing" Baby Shoes and other keepsakes forever. The de-

mand for these Metalized Keepsakes is big . . . and getting bigger every day. (More than a million dollars' worth last year.) In every way, it's a proved proposition. Proud parents everywhere buy on sight!

A NEVER ENDING MARKET

No matter where you live, small town or big city, there is a never ending, ready-to-buy market for "Eternalizing" Baby Shoes — more than 3,500,000 babies this year. This tested plan reaches out and brings in the business. Spare or Full Time, you can make money!

BE YOUR OWN BOSS

Get the facts on this new opportunity. Mail the coupon below . . . TODAY. We'll send you fully descriptive literature, on our No-Risk Trial and Positive Guarantee: "Money Back If You Say So."



Isn't This What You Are Looking For!

1. Steady Income
2. Permanent Future
3. Wide-open Market
4. No House to House
5. Plan Works for You
6. Backed by 25 Year Old Company
7. No-Risk Trial
8. Money-Back Guarantee

WARNER ELECTRIC COMPANY, Dept. 211A
1512 JARVIS AVE.
CHICAGO 26, ILLINOIS

SEND THIS COUPON NOW, FOR SURE!

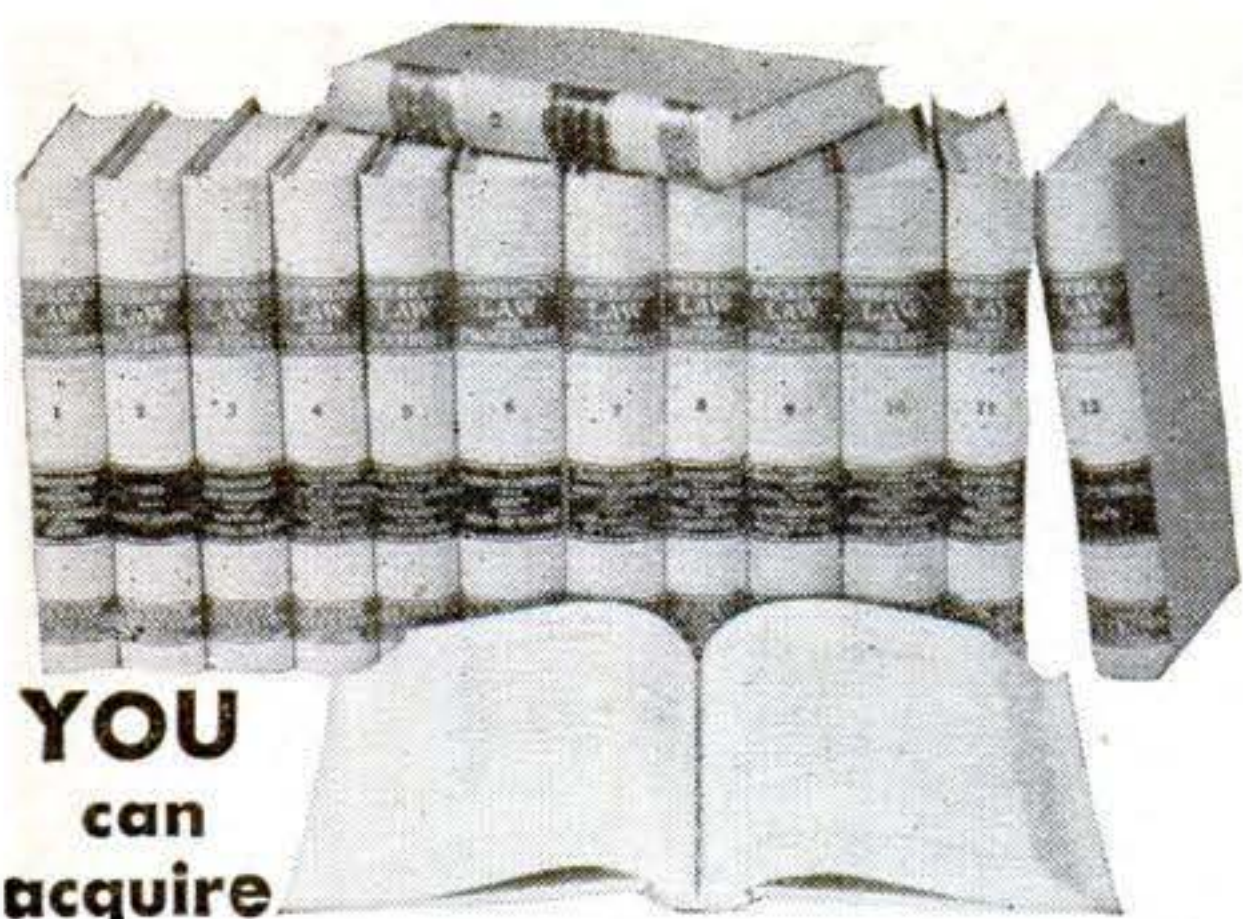
WARNER ELECTRIC COMPANY, Dept. 211A
1512 Jarvis Ave., Chicago 26, Illinois

Please send, without obligation, complete details about your No-Risk Trial, Money Back Plan for "Eternalizing Baby Shoes for Plus Profits."

NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....



**YOU
can
acquire**

LAW NIGHTS AT HOME! L.L.B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you *learn by doing*—handling legal problems—not by memorizing rules.

Send for two FREE 48-page booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 S. Dearborn St. Dept. 1183-L Chicago 5, ILL.

Send me your two FREE booklets described above, without obligation.

Name _____ Age _____

Street _____

City, Zone & State _____

BE A SUPERVISOR



**Franklin Technical Institute
Helps Young People Get Ahead**

- The door to well-paid supervisory jobs in industry is wide open—to the man or

woman with specialized technical training. 50,000 graduates of this Boston school have gone out to good jobs in engineering and technical fields.

Practical two-year day courses in industrial electricity and electronics, industrial chemistry, mechanical and machine design, structural and architectural design, automotive service and management, electric wiring and maintenance. Also preparatory and evening classes. G.I.-approved. 40th year.

FRANKLIN TECHNICAL INSTITUTE
39 Berkeley St. Boston, Mass.
Please send free information on all courses.

Name _____ Age _____

Address _____

City _____ State _____

MAKE STERLING SILVER GIFTS

**Make a Sterling Silver Bracelet—Tie
Clasp—Book Mark & Paper Cutter**

**COMPLETELY
ILLUSTRATED
INSTRUCTIONS**

Kit includes sterling silver chain, sheet & wire. Easy to make at home—earn extra money. Satisfaction guaranteed. Send \$5.00 Cash or M.O.—no C.O.D.'s

Empire Smelting & Refining Co.

718 Sansom Street, Philadelphia 6, Pa.

STEADY PROFITS

**Your Own
Business with**

CORADIO

The Coin Operated Radio



Place these specially built radios that play 1 or 2 hours for 25c in the thousands of available hotel rooms, tourists courts, etc. They yield immediate profits and steady income. Install Coradio, the finest made.

Limited capital required. Send for further information. Write today.

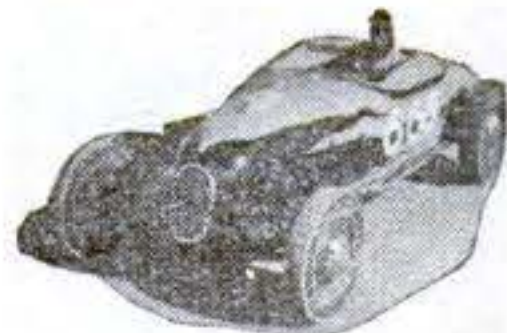
CORADIO Coin Operated Radio, Dept. I

212 Broadway, Phone: BEekman 3-0038-9

NEW YORK 7, N. Y.

SPEED AND POWER HANDBOOK

Very latest methods! Construct your own Superchargers. "Water Injectors," Hi-Compression Heads. Fuel Saving Devices—easily. Save many dollars! Get racing speed, acceleration, dynamic power increases from any automobile! Build fast stock cars! California roadsters! Hotrods! Get ingenious formulas! Speed secrets! Illustrations! Conversion ideas! Also "Economy Information"—Mileage tricks! Tuning techniques! Instructions! Picture catalogues. Including "California Restyling Ideas"—Glossy photographs! Drawings! Model revising! Customizing! Streamlining! Leatherlike bound—\$1.98 complete.



NEWHOUSE AUTOMOTIVE INDUSTRIES, 5941-A4 HEREFORD, LOS ANGELES 22, CALIF.

EYE GLASSES BY MAIL

INCLUDED: Eye Glass Case, Wiper, Eye Glass Cleaner with each order! **30-DAY TRIAL OFFER. NEWEST STYLES. POSITIVE MONEY-BACK GUARANTEE.** Write today for FREE Catalog, Low Prices, Scientific Sight Test Chart!

Broken Lenses Replaced—48-Hr. Service.

**LEE EYE GLASSES CO., Dept. Q-13 SEND NO
4148 Easton - St. Louis 13, Mo. MONEY**



**LOW AS
\$1.95
AND UP**



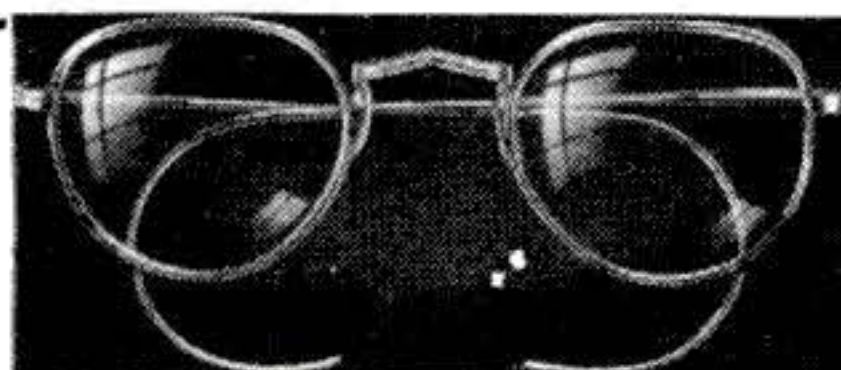
SAMPLES FOR AGENTS Sample offer sent immediately to all who send name at once. A penny postal will do. **SEND NO MONEY—just your name.** KRISTEE CO., 707 Bar Street, AKRON, OHIO

If Ruptured Try This Out

**Modern Protection Provides Great Comfort
and Holding Security
Without Torturous Truss Wearing**

An "eye-opening" revelation in sensible and comfortable reducible rupture protection may be yours for the asking, without cost or obligation. Simply send name and address to William S. Rice, Inc., Dept. 37-C, Adams, N. Y., and full details of the new and different Rice Method will be sent you Free. Without hard flesh-gouging pads or tormenting pressure, here's a Support that has brought joy and comfort to thousands—by releasing them from Trusses with springs and straps, that bind and cut. Designed to securely hold a rupture up and in where it belongs and yet give freedom of body and genuine comfort. For full information—write today!

**L
A
T
E
S
T
S
T
Y
L
E
S**



**SAVE
MONEY
ON
GLASSES**

**NEW
LOW
PRICES**

Many Styles to Choose From
Our fine modern stylish glasses will improve your face and enable you to see far or near, read the smallest print . . . thread the finest needle. **Direct from factory to you**—Save middleman's profit—glasses in latest styles at low manufacturer's price.

12 DAY TRIAL . . .

Money Back Guarantee

You are the judge—if you are not delighted simply return glasses within 12 days and your money will be cheerfully refunded. **FREE EYE TESTER**—SEND NO MONEY. Send name and address on penny postcard today for Free eye tester, instructions and latest style sheet.

**CLARK OPTICAL CO., Dept. 808,
1148 W. Chicago Avenue • Chicago 22, Illinois**



IMPORTED SWISS WATCH

**7 DAY MONEY
BACK GUARANTEE**

**NOW \$4.98 PLUS 50c
ONLY Fed. Tax**

Get the all-purpose Wrist Watch you have always wanted—at this amazing low price!

5 BIG FEATURES

Plus Handsome Metal Stretch-band. Precision Made—Modern Dial—Chrome Plated Case—Unbreakable Crystal—Hands and Numbers glow in dark. Supply limited. Order Now!

SPECIAL Watch with large red Sweep hand for exceptional accuracy. \$1.00 extra. **SENT ON APPROVAL!** Deposit \$4.98 plus tax and postage with postman or send money order, save postage. (Same money-back privilege.) For better watch with large Sweep Hand, add \$1.00.

THE JEWEL BOX, Dept. D, 1674 Broadway, N. Y. 19, N. Y.

Free
Book



RAISE HAMSTERS

The new wonder animals from Syria. Often called Toy Bears. Delightful pets. Everyone wants them. Laboratories need thousands. Clean, odorless. Raise anywhere. A profitable and interesting hobby or business. We furnish breeders and instructions. Write today for free book.

GULF HAMSTERY, 1540 BASIL ST., MOBILE, ALA.

An ASSURED FUTURE for You
Learn Profitable
WATCH REPAIRING

BIG MONEY WHILE LEARNING

Study at Home— or at Our Accredited School
Complete Home Correspondence Course or G. I. Approved Residence School Plan. Also, Post-Graduate Plan at school for correspondence students.

Write Today for COMPLETE DETAILS to
American Institute of Specialized Watch Repair

Dept. 200 270-76 East Building Grand Rapids, Michigan

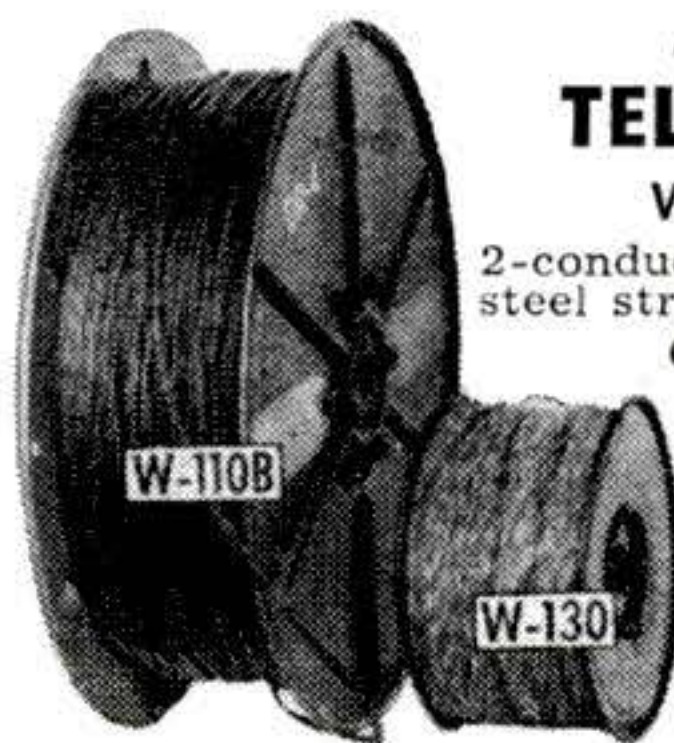


**Talk AS FAR AS 17
MILES WITH
ARMY FIELD
TELEPHONES**

Amazingly simple to install and operate. Just hook up terminals of two or more phones to any two-strand wire and you are ready to talk! Powered by standard flashlight batteries. Compact . . . rugged . . . portable.

Hundreds of uses for quick, low-cost, dependable 2-way communication around home, shop, farm, industry. *Performance equals present-day commercial telephones.* Up to six phones can be used efficiently on a single line, making a complete telephone system. No maintenance required. Each phone complete with self-contained hand-operated ringer. *Every phone checked for perfect operation and fully guaranteed.* Originally cost government \$39.90 each.

USED—good, serviceable condition.....\$ 7.45 ea.
USED—excellent condition 8.95 ea.
RECONDITIONED—(by U. S. Signal Corps).. 10.75 ea.
LIKE NEW, slightly used..... 12.95 ea.
BRAND NEW PHONES, web cases..... 16.75 ea.



**ARMY FIELD
TELEPHONE WIRE**

Weatherproof-Durable

2-conductor, twisted, 3 copper and 4 steel strands, tinned, insulated.

On Original Steel Reels

W-110B Unused, new, but stored in open. Half-mile reels (2500 to 2750 feet). Wt. 85 lbs. **\$14.25** Each

500-foot coil (14 lbs.).....\$3.50

1000-foot coil (28 lbs.)..... 6.50

W-130 LIGHTWEIGHT ASSAULT WIRE. Weighs only 16 lbs. New. half-mile reels (2600 feet) Each, **\$15.00**

All prices FOB Sacramento. No COD. California residents add 2½% for sales tax.

WRITE FOR FREE FOLDER!

**SEND CHECK OR
MONEY ORDER**

LORIS SALES

P. O. Box 1896-A-11

Sacramento, California

**FREE
BOOK**
TELLS HOW
TO BE AN . . .

*Accountant
Salesman
Secretary
Stenographer*

**SECURED FUTURE . . .
FREE EMPLOYMENT SERVICE**

Enter one of the "substantial earnings" fields through Hill's "Success Plan" training. A lifetime opportunity to join thousands of successful graduates in positions secured through our nation-wide employment service. No matter where you live, what you are doing now, Hill's can train you by study at home or in the resident school. Big Free book shows you the way to substantial earnings and an assured future. G. I. Approved.

Hill's Extension School & Business University
Dept. PS-11, 619 W. Main St., Oklahoma City 2, Okla.
Please send your free book, "Through Hill's to Success."

NAME _____

ADDRESS _____

CITY _____ STATE _____

☐ Check here if eligible under G.I. Bill.

MAIL THIS

EASY-TO-USE COUPON TODAY

UP TO
SAVE 85%

in WAR SURPLUS... SENSATIONAL VALUES

at "GADGETEER'S HEAVEN"

IN MANY ITEMS WE HAVE THE WORLD'S LARGEST SUPPLY

NEW HYDRAULIC CYLINDERS, VALVES, PUMPS, FITTINGS, HOSE & TANKS

51 sizes & types.
World's Largest Supply
1001 Labor Saving Adaptations for pulling, pushing, lifting operations. Finest precision workmanship and materials. Liquid and or air operation, developing terrific power.

20,000 Available WRITE FOR CATALOGUE
PRICED TO SELL AT 15% GOVT. COST.

PUMPS NEW
HYDRAULIC, VACUUM, AIR
For every purpose at 15% of Value.

PV-1
May be used as air or fuel pumps for pressure or vacuum. Will pump 7 1/2 gals. oil at 300 R. P. M. Builds air pressure 30 lbs. per sq. in. at 1000 R.P.M. Vacuum draws 26 in. of mercury at 1750 R. P. M.

Vane Type **\$9.49**

ROMEC FUEL
800 GPH at 30 PSI. can also be used as hydraulic for 4 GPM at 400 PSI. or for Vacuum drawing 15 in. mercury at 1500 RPM.

\$6.29 ea.

NEW PRESSURE TANKS

Stainless steel - Shatter proof. Rustless. 10,000 available in 5 different sizes. 1001 uses. G-1 12 1/2 x 24 inches - 2100 Cu. in. capacity **\$4.75**
D-2 6 1/2 x 24 in. - 500 Cu. in. capacity - 7 cu. ft. **\$2.49**
F-1 - 10" x 18" 1000 Cu. in. Capacity **\$3.95**
F-2 6 x 45 in. - 1000 Cu. in. capacity 14 cu. ft. **\$3.95**
A-4 5" x 8" 104 cu. in. Capacity **\$1.35**
A-6 5 1/2" x 15" 280 cu. in. Capacity **\$1.95**

Excellent portable tanks for carrying air in car or trailer. Ideal for painting, cooking, spraying, ocean buoys, underwater fishing or diving. #OR-1 Oxygen Regulator with 500 lb. gauge will fit all tanks **\$1.39**

DC GENERATOR NEW
140 AMP
Direct Current Generator.
especially suited for adaptation to homemade welding unit.

A fast moving item at **\$17.95**

P-1 GENERATOR 200 AMP \$22.50 ea.
K-1 GENERATOR 75 AMPS. \$14.50 ea.

HERE THEY ARE! THOSE TERRIFIC MIX VALUES

GADGET MIX
Especially prepared for the HOBBYIST. Rivets, Spacers, Bolts, Screws, Nuts, Gears, etc. A gold mine. #106, 5 LBS. **\$1.19**

BEARING MIX
Needle, Ball & Roller Bearings in excellent assortment. Sizes from 1/4" to 2". One of our "BEST SELLERS". 15 BEARINGS #170 for ONLY **\$2.95**

HINGE MIX
12 pairs of strap and butt Hinges. Sizes 1" x 1" to 1 1/2" x 4" in length to 8" strap. #170H. A \$3.00 Value FOR ONLY **\$1.09**

ABRASIVE AND GRINDING WHEEL MIX
50 Pieces including honing stone, pencil rolls, wheels. Abrasive sheets, etc. A really sharp value. #170AG. **99c**

SPRING MIX
Torsion, Compression & Tension Springs, acid, steel. A treasure trove for emergencies. #206 **89c**

COMBO-MIX
2 LBS. for ONLY **89c**
Combination of all above, all in one package deal. At special introductory price **\$5.79**

Giraffe Neck Winch Hoist
12" Dia. x 18" high. Has fine wire screen cylindrical filter. Glass gauge for checking water accumulation. Drain cock for water removal. Shut off valve for control of flow of filtered Gasoline. Complete with 2 brass 1 1/4" & 2" x 10" long nozzles. BE SURE OF YOUR GAS AIRCRAFT, TRUCKS, GARAGE **\$5.95**

Gilbarco Gasoline Filter NEW
12" Dia. x 18" high. Has fine wire screen cylindrical filter. Glass gauge for checking water accumulation. Drain cock for water removal. Shut off valve for control of flow of filtered Gasoline. Complete with 2 brass 1 1/4" & 2" x 10" long nozzles. BE SURE OF YOUR GAS AIRCRAFT, TRUCKS, GARAGE **\$5.95**

Stewart-Warner Gasoline New HEATER
AIRCRAFT TYPE. New. 24V. 10 Amp. 40,000 B. T. U. Diameter 6 in. Length 15 in. Stainless steel housing. Complete with Spark plug, gas valve, Thermo Control Switch. Adaptable to trailer, Truck, Home, Boats, etc. **\$6.95**

SW-1 A SWELL DEAL for ONLY \$6.95

SW#2 HEATER
A smaller Compact Car-like Gasoline fired heater with motor, fan blower, Automatic, Thermo Switch. Copper element, glow type spark plug. Mid. by Stewart-Warner. 24V D. C. Can operate on 5 Volt. Ideal for Auto, Boats, Light Aircraft, etc. A Steal at **\$5.95**

Here's a Real "Life Special"
Farm, Auto, New U. S. Navy Portable Pistol Grip. Sealed Beam, 12v. Search Spot, or Emergency. Light - featherweight Gov. Cost our price \$35.00 3 Extra fillers - Red, Green & Amber 93c Set **\$2.95**

NEW FLEXIBLE GOOSENECK LAMP
110 V. A. C. 13 ft. wire with socket, switch and plug. In mounting bracket suitable for home or workshop. Wire alone worth our price of **99c each.**

Vickers Hydric Transmission VT-1
Self contained. 2 H. P. constant torque at all speeds with variable volume reversible, piston pump (controlled by outside lever) supplying piston hydraulic motor. Automatic pressure, dash pot for smooth control. Power output R. P. M. 0 to 1/2 input R. P. M. in both directions. Input R. P. M. 1800 continuous 4000 intermittent. Dash pot can be removed for greater R. P. M. Ideal for Lathes, Duplicator Setup on Mills, Conveyors, Small Cars, Drives, Gearing, Etc. COST GOVERNMENT APP. \$400.00 You'll Chortle when you get it for ONLY **\$19.50**

WINCH HOIST
now equipped with mounting frame, handle, cable, etc. complete. Thousands of Satisfied Users! Hundreds have written, telling us it's the most wonderful tool in the world! Capacity 2500 lbs. 20:1 ratio Bronze Worm Gear Ideal for Garages, Truck loading, Machine Shops, Boat Builders, etc. \$100 Value for ONLY **\$18.99**

TINY MITE WINCH HOIST
1000 lb. Capacity, with 30 to 1 Bronze worm gear. 4" x 1 1/4" Cable drum. Ratchet on hdl. safety factor to hold load, with pin release lowering loads, tightening fences, etc. **\$7.49 ea.**

Plomb Snap-On Socket Set
NEW 6 SOCKETS
3 16, 1/2, 5/16, 11/32, 1/2, 7/16, 2 in. extension, 4 in. extension, ratchet, Flexhandle. All in steel case. New. A **\$3.95**

FIRE EXTINGUISHER
Kiddie Lux Co2 Type. Built to Gov't. spec. wirebound shatterproof Heavy Case. Fully recharged. 3 1/2 lb. 26" x 4" Trigger control with horn 478 type. \$35 Value #601A **\$13.25**
2 lb. Co2 type \$25 Value #582 **\$11.75**
10 lb. Charged with horn Co2 \$65 Value #603 **\$25.75**
15 lb. Break Disc type New #605A **\$29.75**
15 lb. Wheel Control #605B **\$32.95**
15 lb. Squeeze grip. New #605C. \$85 Value **\$39.95**

All above Co2 type, fully charged and with horn. Indispensable for small or large planes Trucks, Auto, Home, Factory, Etc.

New Electric Motors
#500 new 1/2 H.P. 27 Volt D. C. 24 Volt A. C. This motor can be readily adapted to 110 A. C. by the simple method of rearranging armature brush leads. We furnish free diagram of instructions with each order. A Sensational Value @ **\$5.95**

Converted to 110 A. C. Equipped with plug and 3' ft. Heavy Duty Cord **\$8.49 ea.**

1 16 H. P. 24 Volt D. C. Motor. Series Wound. New. #501. **\$3.95 ea.**
#502 - 2 H.P. 24 V D.C.M. used, **\$8.95**

GENERATOR 12 V., 25 Amps
at 1800 to 4200 R.P.M. Trucks, Aircraft, Radio. A Real Value **\$13.95**

GREENLEE - HAND TUBE BENDER
Designed for fast, free action, in bending steel, copper, brass, alum. tubing. Fits in std. vise up to 180 degree bend, makes smooth, small radius bends, free of kinks, scratches, etc. Available in the following sizes: 1/4" @ \$4.50, 5/16" @ \$4.95, 3/8" @ \$6.95, 1/2" @ \$8.25, 5/8" @ \$9.75, 3/4" @ \$11.25 Comp. Set of 6 Benders **\$43.95**

PLASTIC PARALLEL STRAIGHT EDGE
with knobs and rubber pads for non slippage on each section. A must for navigators, mechanics, draftsmen, engineers... You've never seen 'em at **97c ea.**

PNEUMATIC AND AIR TOOLS
10,000 in various popular makes, sizes, types. Cleco, Aro, Ingersoll Rand, Chicago, Pneumatic, Buckeye, etc.

RIVET
#180 Goose-neck
#181 Pistol
Chicago Pneumatic, Cleco, Ingersoll Rand Makes. E3, E2, 3X, 2X, OY \$55 Value **\$8.95**
#186 Squeezer **\$15.95**

AIR DRILLS OR MOTOR SPECIAL
with 1 1/4" JCB Chuck

THOR #210R Model 4526 REVERSIBLE AIR DRILL
1000 R.P.M. Xint. for Tapping **\$19.95**

PNEUMATIC ANGLE DRILL
With Terry Adapter ea. **\$12.50**

CHI. PNU. IMPACT WRENCH
Model 337rs 3/8" sq. dr. fwd. & revrs. 6 spd. cntrl. Send for Catalogue and List of Other Sizes, Types of Pneumatic Tools. **\$17.50**

HIGH PRESSURE OXYGEN BOTTLE
New. Will hold up to 3,000 lbs. PSI. with Co2 used as tire inflator or fire extinguisher, with oxygen for sick room or deep-water diving, etc. Completely equipped with brass valve, 36" hose, dial gauge, & canvas bag **\$2.29 ea.**

TANK
Capacity 21.7 gallons. Aluminum 4 threaded ports. Filler Capacity. Size 7" x 28" x 28". Ideal for Water or Gas Tank on Auto, Boat, Truck, Tractor, Etc. New. #126 **\$5.29**

PIANO HINGE

Overall Width	Length	Price
1 1/4" (5/8" side)	72" alum.	\$1.00 ea.
2" (1" side)	72" alum.	\$1.19 ea.
1 1/2" (3/4" side)	53" cad. steel	.75 ea.
3 1/2" (1 1/4" side)	33" steel	\$1.00 ea.

AIRCRAFT CABLE
Alloyed steel, rust resistant, 3 16" dia. 18 ft. long, with turnbuckle ends. **99c**
On reels in any length
1 16" 3c ft. 5 32 5c ft.
3 32 4c ft. 3 16 6c ft.
1 8 4 1/2c ft. 9 32 8c ft.

RUBBER GOODS
NEOPRENE SHEET RUBBER

Thick- ness	approx. Width, in.	Price per yd.
#325 .020"	1 64 36"	.75
#328 .032"	1 32 22"	\$1.39
#329 .125"	1 8" 46"	\$4.75

Item #329 is laminated rubber sheet with cloth center. Flexible but very fine for heavy wear. Rubberized Hosp. or Bed Shts. 54"x72". \$10.00 Value Only **\$2.29**

ELECTRIC SOLDERING IRON

110 Volt A. C. Vulcan	\$8.50 Value
#198 200 Watt	\$3.95 \$7.00
#198A 100 Watt	\$2.95 VALUE

PALLEY SUPPLY CO.
THE LARGEST FIRM OF ITS TYPE IN THE WORLD

Order from this Ad. All sales final. All Prices F. O. B. Los Angeles. Pay by M. O. or Check. P. O's. Accepted. from D & B firms. 1/3 deposit with C. O. D's. FREE LARGE ILLUSTRATED CATALOG

DEPT. P. S. 118 -
6321 SAN FERNANDO RD.
GLENDALE 1, CALIFORNIA

Classified Ads only 80c per word per insertion, payable in advance. Minimum ad 10 words. To be included in January issue, copy should be in our office by November 25th. January issue on sale January 1st.
POPULAR SCIENCE MONTHLY—351 FOURTH AVE.—NEW YORK CITY 10

1 AUTOMOBILES

RACING Car Equipment for all cars. Engines, Racing Heads, Manifolds, Carburetors, Mufflers, etc. Speed instructions and literature \$1.00—refunded first order. Lee Motorcraft Co., 1412-B Great Northern Bldg., Chicago 4, Ill.

FROM Speedway to Roadway! Track-proved Hi-speed Heads and Manifolds now available for your passenger car! No special tools needed! Increase horsepower 25%! Astounding getaway! Free illustrated catalog. Speedsport, 6215 Diversey, Chicago 39.

PHOTOGRAPHS. World's Finest Automobiles. List. Sample, 10c. Box 1028, Minneapolis, Minnesota.

DIRECT From California—Speed equipment for all passenger automobiles! We pay shipping costs! Beautiful dress-up accessories! Picture-Catalogues 25c. Newhouse Automotive Industries, 5941-A3, Hereford, Los Angeles 22.

"SPEED & Mileage" Manual—Easily obtain greater speed, mileage, racing performance from any automobile! Famous (Original) book shows soup up methods! Speed tuning! Mileage Secrets! Racing Tricks! "Customizing Ideas!" Photographs. Instructions on building inexpensive speed equipment! Economizers! "Hot-Rods"! Speedsters! Sport Conversions! Fast Engines! Superchargers! "Water Injectors"! Mufflers! All about "Economy Tuning", compression, manifolds, ignition, Lubricants, cams, fuels! Latest "Hollywood Stylizing", Streamlining! Custom changes! Plans! "Fascinating Pictorial Supplement"! Catalogues; Charts; Parts List! Deluxe Enlarged Edition—\$1.98. Almqvist Engineering, Milford 43, Pennsylvania.

MAKE Your Model "A" do 100 mph. Lightning acceleration, breath-taking top speed. Complete details. Photographs. \$1 Postpaid. Four Barrel, Box L-2, Eaglerock, Los Angeles 41, Calif.

CLYMER'S Test Reports on Post-War Kaiser-Frazer, Studebaker, 1949 Mercury, 1949 Ford, give impartial, uncensored report 3000-mile economy, speed, record tests. Part-by-part equipment analysis. 3000 owner tabulations in each book. 200 owner letters. Good, bad comments about each make, no punches pulled. Learn the truth. Specify make car interested in. \$1.50 postpaid. Clymer, Dept. B-TR, 1268 So. Alvarado, Los Angeles 6, Calif.

DUALTONE Crystalline packed California mufflers for all automobiles. Large chrome tailpipe extensions. Chromed carburetors, fuel pumps, long shackles, dual manifolds, hi-compression heads, flywheels, camshafts, fender skirts, plexitops. Send 20c illustrated catalogue, deduct from first order. Streamlining Manual \$1.00. Dualtone Mufflers, 2636B India Street, San Diego 1, Calif.

CALIFORNIA custom accessory headquarters. Solid hood sides, grille panels, lowering blocks, fender skirts, mufflers, speed equipment. Picture catalogue with scores of items. 25c. Eastern Auto Supply, 3319M South Grand, Los Angeles 7, Calif.

AUTOMOBILE Racing. Sixth Edition. 100 illustrations. Working drawings with building instructions for Ford-60 midget, California roadster, Offenhauser racer. Details on racer parts. Sample entrance blank. World's record 158.5 M.P.H. rear engine four-wheel drive car. Interesting information for fans, drivers, mechanics. \$2.00 postpaid; \$2.25 C.O.D. Ray Kuns, Department 62, Cincinnati 27, Ohio.

INITIALS—For Automobile Doors. Beautiful One Inch Gold Decals. Postpaid 6 for \$1.00, 3 for 50c. Kessler's Accessories, Centerville, Maryland.

HOT Rod Racing Book. 90 photographs, illustrations famous record holders used California Dry Lakes. Contains hotrod tips, closeup action shots, specifications. 8 beautiful drawings suitable framing. \$1.50 postpaid. Clymer, Dept. B-11V, 1268 So. Alvarado, Los Angeles 6, Calif.

CUSTOMIZE Your Car! Authentic California restyling plans galore! Working sketches, specific model changes. Comprehensive; complete! 130 photographs! Plus accessory catalog! Largest, finest, or refund! \$2 pp. Post Publications, Box 723-ZC, Arcadia, California.

"1949 CUSTOM Styling" Manual—Quickly make car look Hollywoodized, custom, ultra-beautiful by easy, inexpensive methods! 100 photographs, instructions on customizing! Restyling! Streamlining! (new and old cars!) Thrilling sport changes! Latest Custom, Sportster, Convertible, Speed, Model conversions; Accessories; mufflers; Engine "Soup Up" specifications! (Custom Car Catalog included) Enlarged. Beautifully Illustrated \$2. Almqvist Engineering, Milford 43, Pennsylvania.

INSTALL V-8 engine in your Model A for extreme acceleration, more top speed, smoother performance. Complete details, photographs. \$1 Postpaid. A-V-8, Box L-2, Eaglerock, Los Angeles 41, Calif.

"VAPO-STEAMATIC" Water Injection. Easily constructed (for less than \$1.00). Finest automatic "Moist-Humidity" system. Engineering triumph—gets up to 33 miles per gallon. Tremendously increases horsepower! Eliminates ping, carbon, overheating. Reduces wear—lengthens engine life! Copyrighted "Installation Handbook"—(illustrated)—including "Mileage Information." Parts Lists. Picture Catalogues, etc.—\$1.00 complete. Newhouse Automotive Industries, 5941-A1 Hereford, Los Angeles 22.

SEE our ad under motorscooters for Midget Car bargains. Midget Motors Directory, Athens, Ohio.

BUILD speedy Midget Track Racer from cast off parts! Plans, specifications, construction information—\$1.00. Motor Supply, Box CS-1682, Toledo, Ohio.

IMAGINE, 250 miles per gallon your car now. Literature 25c. Jet Engine Co., St. Augustine, Fla.

"RACING Book"—Just out! Photo packed with data on Roadsters, Midgets, Dirt, Championship Cars—Drivers! How to speed up passenger cars—Build 145 m.p.h. racers! Hotrods! Sports Cars! Stock conversions! Power equipment! All about speed tuning, streamlining, superchargers, fuels, Valves, Speed Trick! Racing Secrets! Records! Formulas! Drawings! Action Pictures! Sensational \$1.98. Almqvist Engineering, Milford 43, Pennsylvania.

CLYMER'S 1948 Indianapolis Race Year Book. Complete information. 100 photographs, charts, drawings, cartoons. \$1.50. DeLuxe Fabrikoid bound \$2.50 postpaid. Clymer, Dept. B-548, 1268 So. Alvarado, Los Angeles 6, Calif.

MAKE your Ford fast! Complete details, photographs. How to construct 120 mph Hotrod. \$1 postpaid. California Bill, Box L-2, Eaglerock, Los Angeles 41, Calif.

SOUP up your stock car. Photos, Instructions. \$1.50. Hollywood Hot-Rod, Box 9626S, Hollywood 27, Calif.

POWER and speed equipment for all cars. Tops in heads, manifolds, cams, mufflers, etc. Save on Edmunds, Edelbrock, Offenhauser, Meyer, Weiland, or Knudson equipment. Harmon-Collins Camshafts. New illustrated list 25c. Chevrolet or V8 hopup instructions \$1.00. Give make. Alden Motors, Oakland City, Indiana.

"SPEED and Power" Handbook—Very latest Methods! Construct your own Superchargers. "Water Injectors." Hi-Compression Heads. Fuel Saving Devices—easily. Save many dollars! Get racing speed, acceleration, dynamic power increases from any automobile! Build fast stock cars! California roadsters! Hotrods! Get ingenious formulas! Speed secrets! Illustrations! Conversion ideas! Also "Economy Information"—Mileage tricks! Tuning techniques! Instructions! Picture catalogues. Including "California Restyling Ideas"—Glossy photographs! Drawings! Model revising! Customizing! Streamlining! Leatherlike bound—\$1.98 complete. Newhouse Automotive Industries, 5941-A2 Hereford, Los Angeles 22.

USED-Car Buyer's Handbook. Includes authoritative specific late model evaluations! Complete tests, dealers' tricks, graphic photographs! \$1 pp. Post Publications, Box 723-TC, Arcadia, California.

MODEL "A" and "T" Ford Book. 572 pages, complete information repairing, maintenance, servicing both models and Fordson Tractor. \$3.50. Model "A" book only \$1.00 postpaid. Clymer, Dept. B-ATA, 1268 So. Alvarado, Los Angeles 6, Calif.

AUTOMOBILE Racing Book. Fifth edition-revised. Tells how to build dirt tracks bodies, frames, engines. Records, superchargers, rules, formulas, plans, stock conversions, roadster racing, fast Fords. \$1.00 postpaid. \$1.15 C.O.D. Ray Kuns, Department 274, Madisonville, Cincinnati, Ohio.

"SPEED up, customize your car!" Famous Racing—Speed Equipment—Beautifying Accessories—Dual Manifolds—Heads—Custom Mufflers—"Superchargers"—Water injectors—Hollywood "Streamliners"—Hotrod Supplies. Low Factory Prices! Beautiful "Handbook Catalog" 20c (refundable). Almqvist Engineering, Milford 43, Penna.

CHEVROLET Speed manual now available to enthusiasts desiring real "hotrod performance" from their 1937 thru 1948 Chevrolets. Complete data and photos for building honest 110 mph road car, 130 mph hotrod roadster. Every page worth the total cost of only \$2.00 postpaid. California Bill, Box L-2, Eaglerock, Los Angeles 41, Calif.

2 AUTO SUPPLIES & EQUIPMENT

AUTO parts for all autos and trucks. Trans, motors, differentials, fenders, carburetors. Also Body Parts, Security Auto and Truck Parts. 1923-PS Grace, Chicago 13.

AUTO parts. Buy direct. Get dealers' prices. Represent us in your territory. Write requirements. Specify car make. Mechanics Auto Parts, Factory Warehouse. 3807-PS N. Ashland, Chicago 13.

AUTO Parts, all kinds. Prices upon request. No catalog. Meyers Auto Parts. 820 Dryades, New Orleans, La.

BRUSH Plating Outfits connect to a battery. No tanks or shop required. Free particulars. Gunmetal Co., Avenue K, Decatur, Illinois.

SHABBY Automobile? Apply one application of the revolutionary new discovery, KP-Clear, and make your old, dull, chalky automobile finish like new. Not a wax or polish. Deposits a brilliant, transparent plastic coating which dries in one hour. Enough KP-Clear for one automobile, including applicator. \$2.00. Shipped C.O.D. or send \$2.00 and save charges. Kimball Products, Dept. 202, 26970 Princeton, Inkster, Michigan.

LEATHER Palm Work Gloves Six Pairs \$3.00. Leather Associates, 117 East 29 Street, New York 16, N. Y.

SEAT Covers, Front or Rear. C. Page, Franklinville, N. Y.

CHEVROLET Parts. Scarce motor, body, sheet metal parts. Grossman Chevrolet, Minneapolis, Minnesota.

"SEAL Cracked Batteries"! Cement \$1.00 can. Guaranteed! Postpaid! Batteryman, Grand Junction 1, Colorado.

THE A B C of water injection. Complete information Free. Advanced Automotive Products, 563-7 Lake Road, Webster, N. Y.

MOTORISTS save gasoline by Vacuumating overrich mixtures. Fits all cars. For Free particulars write Vacuumatic, Dept. 1409, Wauwatosa, Wis.

INSTANT starting! Save gas! 1949 "Lektron" atomic coil booster. Easily installed. Only \$2.00. Money-back guarantee! Specify car. Electronic Industries, Cleveland 11, Ohio.

CARBURETOR repair kits, electrical service parts, fuel pumps, etc. Carburetor Service, 600 LaPrairie, Ferndale 20, Mich.

WELDING bodies, block; repairing fenders, bumpers easy with Hobart Welders. Low cost, adds \$\$\$ to your profits. Catalog free. Write Hobartweld, Box P-1182, Troy, Ohio.

CONVERTIBLE Tops—Completely sewn. Easily installed. Reasonable prices. Free literature. Rio Top Company, 1370 Roanoke, Newport News 19, Virginia.

"WATER Injection". Free, descriptive, illustrated, instructions. Neher Industries, LaVerne 6, California.

CARTOP Carrier. Transports skis, boats, etc. easily, safely. Streamlined steel bars, interchangeable parts, attractive. \$13.00 prepaid. Boyle's, 93 Massachusetts Avenue, Boston 15, Massachusetts.

PISTONS—Old and New Cars. M. Merryman Co., Lawndale, Calif.

POPULAR SCIENCE OPPORTUNITIES

3 AUTO TRAILERS

BUILD Your own trailer! Save money! Have every feature you want! Plans for house, sport, camp and utility trailers. Catalog describing 9 models 10c. 15c in Canada and overseas. Jim Dandy, Box 125-B, Wausau, Wisconsin.

TRAILER Plan Catalog—all types, house, camp, boat, etc.; including complete line trailer parts and accessories, plus booklet, "Trailer Building,"—send \$1.00. Marine Mart, Buffalo 7-A, New York.

4 MOTORCYCLES, BICYCLES, SUPPLIES

WHEELS! Build wagons, scooters, mowers, trailers, wheelbarrows, grocery carts, baby carts, play pens, baby carriages. 4" to 16". Free list. Trulsen Mfg. Co., 811 E. 31, Kansas City, Mo.

WHEELS. Tires, Tubes for Motor Scooters, Midget Cars, Wheelbarrows, and Industrial equipment. All sizes. Bicycle Parts, accessories. Largest stock in United States. Send dime for list. Cycle Transport Company, 1241 S. Michigan Ave., Dept. C, Chicago 5, Illinois.

RECONDITIONED motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 1, Mo.

MODERN Motorcycle Mechanics Manual—Latest third edition 600 pages 275 illustrations, covers all British and American motorcycles, most complete motorcycle book available—\$3.65 postpaid. Nicholson Bros., Saskatoon, Canada.

WHIZZER. Cushman High Compression Aluminum Heads \$4.95. \$6.50. Williams, 1953 East Colorado, Pasadena, California.

MOTO-Scoot—\$35. Midget racer—\$15. Indian Motorcycle—\$30. Cushman Motorscooter with extra tire—\$20. Motors—\$3 and up, homemade Motorscooter—\$10. Send 25 cents for new catalog listing these and many other sensational bargains in used motors, wheels, tires, motorscooters, midget cars, motorbikes, etc. Associated, Box 1764-CS, Toledo, Ohio.

MIDGET Car with three-speed transmission—\$35. Cushman Motorscooter—\$15. Shaw Bicycle Motor—\$15. Harley-Davidson Motorcycle—\$15. Motorbike outfit—\$15. Rush 25 cents for special new catalog listing amazing bargains in motor-scooters, used motors, tires, parts, midget cars, etc. Gall, 538 Erie, Toledo, Ohio.

EASILY build Professional Midget Racer, Motorscooter, Midget Roadster, or Midget Motorcycle from cast off parts. Plans, specifications for all four contained in illustrated handbook. 25 cents. Directory of bargain priced used parts and motors included free! Mid west, 3839 Drummond, Toledo, Ohio.

SENSATIONAL clutch operated Motorscooter \$49.75! You assemble from our factory finished kits. Uses any gasoline motor. Complete plans, literature—25 cents. Zipscoot, Toledo 6, Ohio.

MOTORBIKE less motor \$5; new motorbike conversions \$5; used motors \$3 up; 4 h.p. Merkel bicycle motor \$25; Briggs motorbike complete \$38; Factory built motorscooter complete \$40, others as low as \$7; midget racer and parts \$40. November and December Special: Four balloon tires \$3. Mailorder only. Over 6000 tires in stock. Plenty new midget cars, motorscooters, automatic clutches, transmissions, engines at factory prices. Send 25c for Big War-Bargain catalogue Number 28 just out listing the above and almost 400 other bargains. (35c by First Class Mail). Midget Motors Directory, Athens, Ohio.

145 AIRCOOLED Engines Cheap. List Dime, Donz, Mount Ephraim, N. J.

MOTOR Scooters, bicycle engines. 120 miles gallon. Dime for catalog. Clymer, Desk B-115, 1268 So. Alvarado, Los Angeles 6, Calif.

5 AVIATION

PROPELLERS. Plans for ice sleds, snow sleds, air boats, Catalog 10c. Banks-Maxwell, Ft. Worth.

PROPELLERS 3-2 Blade, Sleds, airdrive boats, Catalog. Standard Aircraft, Box 387, Ft. Worth, Texas.

7 ELECTRICAL SUPPLIES & EQUIPMENT

LAMP parts wholesale. Large variety available for building, repairing, or remodeling. Order in any quantity. New 1948 catalog 10c. Gearon Company, 27H South Desplaines, Chicago.

FLUORESCENT lights. Make your own... ideal for home and shop. Complete electrical parts for 20-watt fixtures with detailed instructions. Also larger sizes Postpaid only \$2.00. Write Fluorokit, 322 E. Reservoir, Milwaukee, Wisconsin.

LELAND Electric generators, 2.5 KVA, 120 volt, single phase, 60 cycle, with radio filter. Turning at 1800 rpm, produces 2500 watts. \$125.00 freight prepaid. Hopfer & Company, 3124 East 14th Street, Oakland, California.

LAMPS—If you build or repair, send 10c for 36 page, illustrated catalog showing every part necessary. If dealer send business card for quantity discount. Gyro Lamps, 5402B Clark, Chicago 40.

ELECTRIC Pencil: Engraves all metals, \$1.00. Beyer Mfg., 10511-C Springfield, Chicago 43.

"CONSTAVOLT" selenium rectifiers! Full voltage at full load. New! Automatic! Free Booklet. Lectralabs-2, Wakefield, R. I.

WANTED used rectifier, equipment for novelty electroplating. Guardian Press, Little Rock, Arkansas.

ELECTRIC Eye Kit. Send for details. Gelbrook Products, 9508A Queens Blvd., Rego Park, N. Y.

LAMPS—Build own Originals, parts wholesale any amounts. Catalogue 10c. Brown Lamp Co., No. 501, Wellston, St. Louis 12, Mo.

CHRISTMAS lights, bulbs, appliances, vacuum cleaners, sewing machines. Jeanette Electric, 159 West 23rd Street, N.Y.C. 11, N. Y.

FLUORESCENT Bench Lamp, adjustable, clamp-on, excellent for workbench, \$6.95 including 15 watt tube. Send check or money order. Compton Lighting, Box 171, St. Louis, Mo.

RECTIFIERS: Ramyr Selenium Platers, 10, 30, 50, 100 amp sizes. Immediate shipment. Complete line of bronze baby shoe mounts. Write for list. Hollywood Bronze Supply, Dept. S, 1770 N. Vermont, Hollywood 27, Calif.

8 WELDING, SOLDERING

WELDER—New portable champion special Transformer Welder; 110/220 volts. AC. 8 heat stages. Welds, brazes, solder, cuts all metals. Complete with electrode holder, helmet rods, carbons, fluxes, cables. Also special Flame Weld Torch. Easy to use. Full directions. Splendid for shop, farm and home repairs. Guaranteed. Only \$27.50. Also resistor model. Now \$14.95. Magic Welder Co., 239 PS Canal St., New York, N. Y.

OXY-ACETYLENE Welding outfit—New. Includes everything: two full oxygen and acetylene cylinders, torches, goggles, lighter, regulators, hose, welding rod, and carrying case. Only \$89.75. Cylinders refilled anywhere. Ideal for hobbyists, garages, repair shops. Guaranteed. Burdett Oxy-Weld Co., 3399 Lakeside Ave., Cleveland 14, Ohio. Welding supplies since 1923.

WELDING—a profitable trade. Demand for trained men. Learn quickly at best equipped school in U. S. G.I. Approved. Free catalog. Write Hobart Welding School, Box P-1185, Troy, Ohio.

"BUILD-UR-OWN" portable arc welder. Save \$300. Easy with Hobart Generator plus auto engine. DC Welders, or AC Power Plant Combination. Free instruction book. Write Hobartweld, Box P-1183, Troy, Ohio.

WELDERS—for all requirements. Free catalog. Write Hobartweld, Box P-1184, Troy, Ohio.

"PORTABLE oxyacetylene welding outfits complete both cylinders \$124.50, acetylene generators with two dozen charges \$89.50. Request Folder 7. Delta Oxygen, 305 E. Federal, Baltimore, Maryland.

WELDERS. 110V, welds 1/2" steel \$32.50. Morris Welding Service, 1850B State, Schenectady 4, N. Y.

10 MACHINERY, TOOLS, SUPPLIES

16" AND 26" size jigsaws. Ten Dollars & Fourteen Dollars, mail money order. Shellington Machinery, 2055 W. Hunting Park Avenue, Phila. 40, Pa.

WAR Surplus in small tools for machine shop—Send 15c for bulletin. Travers Tool Co., Dept. S, 5 Court Square, Long Island City 1, New York.

QUICK change sander, fits any electric drill \$1.95. Circular. Wasco Manufacturing, Box 111, Blue Island, Illinois.

YOUR own machine shop will save time and money on your repairs. Your neighbors work will pay you \$2-\$3. per hour. Our surplus machines are accurate, low-prices and delivered at once. Screw-Cutting engine lathes \$150. and up. Powerful upright drill press from \$110. Milling machines \$150., some higher. Shapers, welders, band saws, grinders. Our guarantee; Satisfaction or your money back. Conversion Parts Co., 277 Adams St., Boston 22, Mass., U.S.A.

BACK geared metal and wood cutting 12" band saw. 6" jointer, ball bearing, 47" long. Ball bearing spindle shaper, 15" x 20" table. 8" tilting table, ball bearing bench saw. Lowest priced line of high grade tools on market. Free catalog. Dealers wanted. Backus Machine Co., Boyd, Wisconsin.

SHEBEL Saw Filer files all saws. Circular. A. P. Shebel, 730 S. 2nd St., Milwaukee 4, Wis.

CONCRETE Block machines from \$39.50. Catalog free. Concrete Equipment Company, 5466 Gravois, St. Louis 16, Missouri.

ADAPTERS convert hack or jewelers' saw frames to new tool using endless belts, roll strips, other abrasives, etc., for sanding, polishing, etc., lathe work, flat, irregular surfaces. Detail sheet one dime; included with pair of adapters at \$3.00. Gerrits & Gygi, P. O. Box 214, Appleton, Wisconsin (U.S.A.)

HOME Lathe owners—Build your own attachments. Send for picture, sample of work and list of blueprints. Cut gears, ratchets, etc. Make neat screws easy way. The Home Shop, 415A Raymond Ave., Glendale 1, Calif.

BAND Saw—Special \$14.95—Ideal for hobbyists and home workshop. Free circular. Woodcraft Tools, Inc., 147 E. Lake, Minneapolis, Minn.

"REPAIR Leaks Without Tools!" Patented Clamps! Combination Set fits 3/8" to 2 1/2" pipes. Prepaid \$2.00. Lincoln Equipment, 10-B South 18th, Philadelphia 3.

METALS; Aluminum, Brass, Steel in all shapes. Catalog 10c. Refundable. F & H, 87 Warren Street, New York 7, N. Y.

SCREWCUTTING Lathe—\$44.50. Shapers, millers, drills, chucks. Machinery, Newfane 1, Vermont.

DRILL GRINDER for twist drills \$2.95. See ad on page 268.

11 MACHINERY FOR SALE

ELECTRIC Power Plants PE-99 Government Surplus, 7 1/2 KVA Three Phase can used single Phase Run Less Than 1000 hours. Wisconsin air cooled engine Automatic Starter \$1500.00 Only \$225.00. While they last. Guy White Radio Co., Macon, Georgia.

13 BATTERIES, GENERATORS, ETC.

WIZZ Electric Motor: (3" x 1 3/4"). Flash-light cell operates. Parts complete plus instructions 30c Postpaid. Eltro, Deer Park, N. Y.

EDISON Non-Acid Lifetime Storage Batteries for Home Lighting, Motors, Industrial uses, Radios, etc. Free interesting literature. Hawley Smith Co., Croton Falls 2, N. Y.

14 BOATS, OUTBOARD MOTORS, ETC.

MARINE fittings, accessories—Thousands of items (pictured priced)—Prompt delivery, Catalog \$1.00. Marine Mart, Buffalo 7-A, New York.

MARINE Plywood Sheets (fir, mahogany, etc.) and boat building lumber. Send 25c (coin) for "Plywood Hints" with stock list. Marine Mart, Buffalo 7, N. Y.

POPULAR SCIENCE OPPORTUNITIES

FULL size, cut to shape boat patterns, blueprints, 7½—38 feet. Illustrated "Build a Boat" catalog, 10c (coin). "How to Build Boats" book, \$1.00. PolyWog Houseboat Plans \$10. Cleveland Boat Blueprint Co., Dept. A-77, Cleveland, Ohio.

BOAT blueprints—Full size patterns—60 designs by naval architects—Row, power, sail. Catalog 25c—(With builders' handbook, "Plywood Boats," \$1.00). Marine Mart, Buffalo 7-A, New York.

CONVERSION Kits for Ford, Willys, etc. Also air cooled engines, clutches, vee drives and stern drives. Send 50c (coin) for catalog and booklet, "Conversion Hints", Marine Mart, Buffalo 7, N. Y.

SPECIAL: New Silvertrol Electric Outboard Motors. Operate on 6 or 12 volt battery. Full reverse, 2-speed switch, direct drive, adjusts to any height or slant of transom. Weight 22 lbs. \$37.50 each. F.O.B. Chicago. No C.O.D.'s. Mercury Distributor Sales Inc., 5858 West Lake St., Chicago 44, Illinois.

MARINE conversions for Ford and Jeep engines. Catalog 10c. Lehman Manufacturing Company, Department A, Newark 2, New Jersey.

CANVAS Covers, war surplus, all sizes; tents, clothing, paints, camping equipment. Morsan, 10-17P 50th Ave., Long Island City 1, N. Y.

P-38 BELLY tanks, New. Steel, 10 foot or 6 foot size, \$9.95. Anzio Boat Co., 89V, Merced 5, Calif.

OUTBOARD motors—good values, used motors. Also used parts for most makes and models. Crandall-Hicks Co., 912 Commonwealth, Boston, Mass.

NEW, used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

BOAT kits—See display adv., page 281. Marine Mart, Buffalo 7-A, New York.

15 ENGINES, MOTORS, ETC.

WINDING Data, listing 225 motors, single and three phase, \$1.00. Motor Data, Box 7631, Kansas City 3, Mo.

WELDING Generators, 150 ampere \$47.50. ½ Horse, 1750 RPM motors \$19.75. ¾ Horse, 3450 RPM \$22.50. 1 Horse, \$28.50. Compressors \$17.50. Butler, 1885 Milwaukee, Chicago.

ELECTRICAL repair men, send for literature on Motor Winding tester and A.C. motor winder. Motor Industries, Quincy, Illinois.

MOTORS! ½ HP DC converted to AC. All new. High speed 110 volt, 25 or 60 cycle, ball bearing motors. Actual value about \$75.00. Now \$15.00 each or 3 for \$40.00. With forward and reverse switch \$19.50, 3 for \$50.00. Countless uses for home mechanics. Can be used in any position. Order today! Immediate delivery! No C.O.D. order. "Amazing Bachman's," 27 Herman Street, Rochester 5, New York, Dept. PS.

"POWER-WELDER"—New A.C. Welder-A.C. Power Plant. Portable. Gives you welding, plus power for tools, lights, motors; anywhere, independent of power lines. "Build-ur-own" and save \$300. Free instruction book. Write Hobartweld, Box P-1186, Troy, Ohio.

SELSYN Motors, 115 volt, 60 cycle, heavy duty, ¾ x 4½. Special \$7.25 per pair. Weber Electric, Dept. 5, 150 Maple, Hershey, Penna.

SIMPLEX - Motors - For - Water - Air - Steam-Pelton-Wheels-Jet-Driven-(Duplex-Motors-Double-Jet-Driven.) All Sizes: Specials-to-Order. Duplex Motors, Burlington, Iowa.

16 AMERICAN POLICE JIU JITSU

DEADLY Judo—Fiercest fighting technique. Trick knockouts. (200 photographs—plus illustrations.) Expert instructions—Three volumes. Complete \$2.25. Variety House, Box 46-A, Wall Station, N.Y.C. 5.

18 BODY-BUILDING COURSES

BOXING—Learn Scientific fighting. Knockout blows—defense—attack—training—diet. (Illustrated). Three volumes. Complete \$2.25. Variety House, Box 46-AA Wall Station, New York 5.

BARBELLS! 95 pound set \$10.80; extra plates 10c pound. Send for free course and catalog. Bur Barbell Company, Lyndhurst, New Jersey.

THE world's strongest men are built by the Key Institute of Physical Culture, Titusville, Florida.

BARBELLS, Dumbbells, Exercise equipment. Courses. Free booklet. Good Barbell Co., Reading, Penna.

BE Muscular, Handsome! Dynamic body-building course, 60 illustrations. Complete \$1.00. Peters, Box 308-A, Hemet, Calif.

19 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY

"SHOTGUNS"—"Rifles"—"Handarms"—"Ammunition"—"Rods"—"Reels"—List 10c. PS-Rudolph's, Atchison, Kansas.

BOWS-Arrows, write headquarters for Archery equipment. Quality products. Popular prices. Catalog 10c. Large illustrated hand book instructions, aiming and shooting. 50c. Archery, 617-A So. State, Chicago 5.

180 PAGES antique and modern pistol, sword, etc. values, 50c. Robert Abels, 860½ Lexington Ave., New York 21.

COMPLETE design, model, light manufacturing facilities. Jones Sporting Goods Mfg. Co., Banning, Calif.

SEND 10c for list 100 used guns. Frayseths, Willmar, Minn.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 40c. Smith Museum, Runnemede, N. J.

SHOTGUNS, Rifles, Revolvers, Over 500 Modern, Obsolete, Also Cartridges. List .10 coin. Ed Howe, 26 Main Street, Coopers Mills, Maine.

20 FIELD GLASSES, TELESCOPES, ETC.

TELESCOPES, Binoculars, Microscopes, —big bargain catalog free. Brownscope Company, 24 West 45th Street, New York.

"TERRIFIC" Bargains—Government Surplus Telescopes, Binoculars. Send \$1.00 for 10 piece Hobbyist Lens Set. Contains magnifying and reducing lenses. Send stamp for "Bargain" list. G. Jaegers, 93-08 95th Ave., Ozone Park 16, N. Y.

6 x 30 NEW Bausch and Lomb, USN. Light-weight. Coated. With Case, Straps. \$65.00. Add 20% Tax. New Telescopes (no tax). 10 x 23, \$13.95; 15 x 31, \$22.95; 30 x 53, \$29.50. Money Back Guarantee. United, 7941 So. Halsted, ARF-516, Chicago 20.

FACTORY new, coated, K6 \$39.00, K4 \$36.00, K2.5 \$32.50. Choice of reticule. Target scopes, mounts, binoculars at low prices. List available. Robert Kreider, Box 25, Palmyra, Pa.

ASTRONOMICAL Telescopes, binoculars, microscopes; Bought, sold, repaired. Books. Lists 10c. Rasmussen-Reece, Amsterdam, N. Y.

POWERFUL astronomical Refracting telescope, equatorially mounted, all metal, two eyepieces, \$16.50. Blum Optical Lab., 4213 Gifford Ave., Cleveland 9, Ohio.

POWERFUL Astronomical telescopes easily made. Perfect lenses and instructions: 100X \$3.00, 100X and 200X \$4.00, 100X, 200X, and 400X \$6.00. Clear Vision, full power guaranteed. Instructions alone 10c. Suffolk Science Service, Manorville, N. Y.

GIANT Astronomical telescope 100 diameters magnification, with tripod. Full power, clear vision, \$15.00. Suffolk Science Service, Manorville, N. Y.

24 DOGS, BIRDS, PETS, RABBITS

RAISE Chinchilla rabbits. Year-round money-makers from furs, meat, breeders. Experience unnecessary. Write today. Willow Farm, Sellersville 16, Pa.

\$250 MONTHLY. Raising Angora Rabbits. Particulars free. White's Rabbitry, Newark, Ohio.

RAISE Guinea Pigs. Makes money at home. Big demand. Booklet free. Taylor, Box 426B, Hapeville, Georgia.

REPTILE Bulletin 5c. New Catalogue: Pets, Hobbies, Supplies, 10c. Chameleon 25c. Quivira Specialties, Topeka, Kansas.

SEE Gulf Hamstery ad page 77. Shows picture of Hamster.

GOLDEN Hamsters—Novel Pets. \$5 brings breeding age pair including two metal cages, instructions. Hathaway Hamstery, 609 Deerfield, Silver Spring, Md.

25 FROG RAISING

FROG-RAISING—New book explains everything! Broel, 1035 Marlborough, Detroit 15, Michigan.

26 FUR FARMING

MINK from Best stock priced reasonable. Carlson Mink Farm, Stromsburg, Nebr.

27 MILK GOATS

"DAIRY Goat Journal—introductory six months \$1—Columbia 32, Mo."

30 FARMS, OTHER REAL ESTATE

OZARK Lands for All purposes. Actual river frontages, 5 acres \$90.00 and upwards. Free list and literature. Hubbard, 424-H, Minnesota Ave., Kansas City 4, Kans.

NEAR Cuyama Oil Field, California, lots three miles from drilling \$80. Delker, Port Republic, New Jersey.

STROUT'S Fall-Winter Farm Catalog—Free! Red cover. Chock-full of bargains Coast-to-Coast. Eqp'd & uneqp'd farms, groves, retirement places, etc., etc. Write today for your Free copy. Strout Realty, 255-ZB—4th Ave., New York 10, N. Y.; 20 W. 9th St., Kansas City 6, Mo.; 453 S. Spring, Los Angeles 13, Calif.

FARMS, acreage, beach sites. Exceptional crop, livestock, poultry production. Good markets and transportation. All year pleasant climate, rainfall averages sixty inches annually, productive soils, reasonable prices. Salt and fresh water fishing, boating, hunting and other sports. Wonderful locations for retired persons. Choice of the Gulf Coastal sections of Northwest Florida, South Alabama or South Mississippi. Write for illustrated information, specify preferred state and purpose for which land is wanted. E. J. Hoddy, Desk 3, Room 108, General Office Building, Louisville & Nashville Railroad, Louisville 1, Ky.

650 FARMS, Ranches, Water Frontage Properties. Free descriptive folders, price lists. Splendid opportunities, Washington, Idaho, Montana, Dakotas, Upper Michigan, Wisconsin, Central Corn Belt. Information regarding Columbia and Missouri River Basin irrigation projects. L. H. Robbins, Milwaukee Railroad, 736M Union Station, Chicago 6, Illinois.

COME to the beautiful, pleasant, healthful Ozarks for cheap homes. Delightful Climate. Free literature. Write, Ozone Land Co., Ozone, Ark.

GOOD FARMS—Ranches, Washington, Minnesota, Montana, Idaho, Oregon, North Dakota. Dependable crops, favorable climate. Write for literature, lists describing typical farm opportunities. Specify which state. J. W. Haw, 120 Northern Pacific Ry., St. Paul 1, Minn.

LOTS \$300—convenient payments. California's finest garden section. On Morro Bay's scenic shores. Wonderful fishing, hunting, boating, bathing. Fertile soil, softest water, temperate climate, congenial community. Free literature. Richard Otto, Dept. Z, San Luis Obispo, Calif.

HOUSEBUILDERS Construction Drawing from your sketches. MacDonald Realty, Austin, Texas.

HOUSTON, Bright Spot of the Nation offers opportunity to investors, home-seekers, details free. Realtor, Box 202, Houston 1, Texas.

31 POULTRY AND SUPPLIES

FARMERS! Make Money with poultry in 1949. Big demand, higher prices. Our Editors will help you. Mail \$1.00 today 24-month trial subscription. Poultry Tribune, Dept. 17, Mount Morris, Illinois.

RAISE Fryers new easy way. One-man home plant earns \$500 monthly. Details free. Fortune Fryer Farms, Box B, Simi, California.

32 PROFITABLE OCCUPATIONS

DETECTIVES Earn Big Money. Excellent opportunity. Detective Particulars free. Write, Wagoner, P-125 West 86th, N. Y.

POPULAR SCIENCE OPPORTUNITIES

\$5000 FROM half acre growing Ginseng. crop bought. Particulars 10c. Associated Growers, 1169 Corydon, Winnipeg, Canada.

IF you work in a factory or shop, you are passing up the opportunity of a lifetime to build a steady Extra Income by selling subscriptions to Popular Science Monthly to your fellow employees. For free kit and complete instructions write on a postcard to—Manager of Agents, Dept. A148, Popular Science Publishing Co., Inc., 353 4th Ave., New York 10, N. Y.

\$40.00 WEEKLY. Made growing mushrooms. Fresh. Dried. Dominion Patent 331.583. free spawn. North American, 169Y Yonge, Toronto, Canada.

DIRECTORY: Foreign Projects: \$1.00. Foreign Service Institute. Lock Drawer 3980, Miami, Florida.

VENEZUELA. Sensational Information about great opportunities for everybody. \$3. H. W. Bardt—Edificio Washington—Apartamento 70—Caracas.

METALLIZE baby shoes and other non-metallic articles. Fascinating work. Big profits. Shuplate, Box 1388, Lawton, Okla.

TYPEISTS—Profitable business at home. Complete copyrighted information. 50c. Gaunt, 3521B Broadway, Chicago 13, Ill.

NO selling, operate coin machines, amazing profits, details Free. Parkway Corporation, Dept. 12, 623 W. North Avenue, Baltimore 17, Maryland.

MAKE Wonder Cement Paint 2c pound. Start lucrative Painting Business. Bryan, Box 702, Cincinnati 1.

33 BOOKS, PERIODICALS, ETC.

MAGAZINES (back dated)—foreign, domestic, arts, Books, booklets, subscriptions, pin-ups, etc. Catalog 10c. (refunded). Cicerone's, 863 First Ave., New York 17, New York.

USED Correspondence courses and books bought, sold, rented and exchanged. Catalog Free, Lee Mountain, Pisgah, Alabama.

"ADULT Bookettes." 25c. Fifteen—\$1.00! Free catalogs! Hirsch, Spring Valley 3, N. Y.

GIFT Subscriptions—All Magazines. Special Xmas rates. Write for circular. Charles Hansen, 1569 Carmona Ave., Los Angeles, Calif.

MAKE extra cash taking friends' magazine subscriptions. Confidential wholesale price list #12 free. General Circulation Co., Inc., 1311 Widener Bldg., Phila. 7, Pa.

"HOW to Use Your Subconscious Powers—A Guide to the Wonders of Self-Hypnosis." Amazing new book! Free details. House of Psyche, 542-D 5th Ave., N. Y. C. 19.

EXCITING and Strange books. Send 25c (coin) for catalog and Private collector list. Rare Book Co., 1219½ North La Brea Ave., Hollywood 38, California.

"HOW To Drive an Automobile." New, Illustrated, \$1. Szafarz, Box 705R, Pawtucket, R. I.

EASY profits taking magazine subscriptions, handling greeting cards. Full details free! Cassell Publishers, Westfield, N. J.

BOOKHUNTERS! All Subjects. Send Wants! Jaher Book Service, 620-K East 178 Street, New York 57.

BOOK Lovers! Send six fictions, good condition, with \$1. We return six Different Fictions. Globe, 37-46—94th St., Jackson Heights, N. Y.

FREE Particulars for Book Bargains. Rosenthal, 200 Ross, Brooklyn 11, N. Y.

HYPNOTISM. Psychiatry. Super-Memory. Sex—illustrated catalog unusual publications. 10c. Adults. Power Publisher, S5, 790 Broad Street, Newark 2, N. J.

ADULT Books—Unusual—Revealing—Illustrated. Five \$1.00. Catalogue 10c. Kogan, 1032-DP, Church Annex, New York 8.

BACK-Date Magazines. Books. Specific issues; years. Arkell's, Tarzana 2, Calif.

NEW Illustrated Catalog. Directory \$1.0. Latshaw Sales, Sunnyside Cl, Indianapolis 44, Indiana.

35 MAGIC TRICKS, PUZZLES, ETC.

"HOWARD Thurston's card tricks, only 50c. Specialty House, Box 542, Danville, Ill."

MAGICIANS' Gamblers' secrets exposed. Cards, Dice, Punchboards, Slot Machine. Catalog 10c. Book Co., Box 671, St. Louis 1, Mo.

WORLD'S largest professional magic shop, keeps you in touch with latest tricks. To receive mailings, send 50c for new catalog. Holden's, 220-P West 42nd St., N. Y.

200 ELECTRIC Stunts, 110 volts, \$1.00. Cutting Sons, Campbell 47, Calif.

FREE Dollar Magic Set with Professional Catalog 25c! "Mysto," 4462-PS Germantown, Philadelphia.

ITCHING, Sneezing Powders, Eighteen Other Tricks and Joker's Catalog 25c. 2404N15, Philadelphia.

"VENTRILLO," Professional Voice-throwing Instrument and Catalog 25c. Box 971-PS, Philadelphia.

500 TRICKS, new 1949 edition. Send 10c for Douglas famous Catalog showing best in good magic, lowest prices, fastest same-day service. 30 years in business. Douglas Magicland, Dept. 2, Dallas, Texas.

LARGE 160 Page Magic Catalog 35c for Beginners and Professionals. Chicago Magic Company, 2300-N No. Mason Avenue, Chicago 39.

BE a Magician. Large professional magic catalog of latest tricks. 35c. Ireland, F-109 North Dearborn, Chicago.

FIVE Popular Tricks with Catalog. 25c. Forrest Perkins, Marinette, Wisconsin.

HYPNOTISM! 25 Lesson Course, \$1.00. Monarch, 38-S Jefferson, Auburn, New York.

LEARN magic, Ventriloquism. Mind-reading. Write for particulars. Quackenbush, Big Flats, N. Y.

400-PAGE Catalogue of 2000 Tricks, pocket, parlor, stage, World's Finest Magic. Send \$1.00 for Catalogue (refunded first \$5.00 order). Kanter's, S-1311 Walnut, Philadelphia 7.

VANISHING Quarter trick and catalog 25c. Sterling Magic Co., Royal Oak, Mich.

EARN Big Money! Learn easily how to be a Magician. For complete information write Stallard Enterprises, 1888A Richmond Drive, Louisville 5, Kentucky.

FREE Trick With Illustrated Magic Catalogue. 25c. Hall Magic, 345 John R, Detroit 26, Michigan.

HYPNOTIZE Speedily! "Master Course in Hypnotism"—photographically illustrated, simplified, complete—\$2.00. Satisfaction guaranteed. Adults. Power Publishers, P15, 790 Broad St., Newark 2, N. J.

TRICKS, Secrets, cards, punchboards, etc. explained. Big illustrated circular free. Mack, Box 1278-P, San Francisco.

36 GAMES, ENTERTAINMENT

"SPLATTER," new harmless slingshot game cannot break windows, real sport for everyone. \$1.00 postpaid. Alida Toy Company, Penn's Grove, New Jersey.

HOME Model Slot Machines and Coin Operated Games. Write for catalog. Webb Distributing Co., Dept. P4, 6 South Kedzie Ave., Chicago 12, Ill.

ENTERTAIN friends with Emcee—Entertainer's handbook—25c. Frankel, 3505 Adams, Chicago 24.

WONDER-All Action Bouncing Stick Skillful Entertaining. For all ages. 35c. Three all different, one dollar. P. Agrillo, 33 West Sixth St., Gilroy 1, Calif.

37 COIN COLLECTING

GET profit and pleasure in collecting old coins. Send 10c for 56 page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Bldg., Ft. Worth, Texas. Largest rare coin establishment in U. S. Established 48 years.

FREE! Foreign coin, banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-D50, Mass.

COMMEMORATIVE \$½ — Columbus, Washington, Cleveland, Stone Mountain, \$1.50 ea. Illustrated Catalogue 25c. Norman Schultz, Salt Lake 9, Utah.

WANTED: Certain coins. Will pay up to \$2.000. Send 50c for illustrated catalogue. The Central Coin Exchange, 504 So. Yale Ave., Columbus, Ohio.

OLD Money Wanted. Do you know that Coin Collectors pay up to \$100.00 for certain U. S. cents? And high premiums for all rare coins? We buy all kinds. Send 4c for Large Coin Folder. May mean much profit to you. Numismatic Co., Dept. 30, Fort Worth, Texas.

BOUND 128 Page Catalog and 10 coins bargain \$1.00. Katen, 487 State, New Haven 10, Conn.

WE purchase Indianhead pennies. Complete allcoin catalogue 10c. Woodrow Fairview, 277 Broadway, New York 7.

U.S. coins lowest prices. Send stamp for lists. Hutchinson, 3463 I Street, Philadelphia 34, Penna.

50.000 COINS, medals, paper money. Illustrated lists free. Nagy, 8-P South 18th, Philadelphia 3, Pa.

BARGAINS—20 different Indian Head Cents \$1.00. 4 copper-nickel cents \$1.00. 4-2c pieces \$1.00. 4-3c Nickels \$1.00. 4 Whitman Coin Albums \$1.00. Handbook 75c. 254 Page Guidebook \$1.50. Retail Catalogue 15c. Bebee Coin Company, 1180 East 63rd, Chicago 37, Illinois.

38 OLD STAMPS WANTED

WHAT have you to offer? Collection? "Shoe box" accumulations? Anything in Stamps? We urgently need them. Spot cash paid. Cosmopolitan Stamp Co., 1457 B'way, N. Y. C.

40 STAMP COLLECTING

DEALER'S Wholesale Catalog. Postage 3c. Franksco, 5031 Queensbury, Baltimore, Maryland.

ZOWIE-E-E! A Barrel of Fun for only a Dime! 500 United States Stamps—Absolutely unpicked and unsorted, just as received from church missions. Many varieties, including large commemoratives, airmails, high denominations up to \$5.00! Stampdom's biggest package of fun, and you might find something really valuable!! Price only 10c to serious approval service applicants. Money back if not delighted. Illustrated bargain lists with each order. Mystic Stamp Co., Dept. 55, Camden, New York

WOW!! \$10.00 Worth Of Fun—Only 10c! What a treasure hunt! Big package 500 Foreign Stamps from foreign missions, other sources. Includes Stamps from Africa, South America, Free French, Somali, Palestine, etc. Includes airmails, commemoratives and stamps worth up to 50c. This offer sent for 10c to Approval Applicants only. Jamestown Stamp Co., Dept. 5, Jamestown, N. Y.

200 DIFFERENT Stamps—cataloging up to 15c each—only 3c to approval applicants! Littleton Stamp Co., Littleton 47, N. H.

NICARAGUA "Tin Pan Alley" Diamond, Ecuador showing George Washington, and American Flag in natural colors. Fezzan, Trieste. "American Army" stamp First U.S. Commemorative, \$100.00 Shanghai, Corsica, Anzac, Antique, others all 5c approvals. Capital Stamp Co., Dept. 10, Little Rock, Ark.

FREE—Famous Americans set, plus Flag set, plus the National Parks set, plus the Presidential set to the \$5. A total of 90 stamps absolutely free to customers for our unsurpassed United States or Foreign selection. Send 3c postage for 15 of the above mentioned stamps and full particulars. Triboro Stamp Company, 145 Nassau Street, Dept. 211, New York.

FREE! Crystal-Mount Sample, Harrisco, 204 Transit Bldg., Boston, Mass.

300 DIFFERENT given free with approvals. Postage 3c. Windsor Stamps, 1435 E. 67th Place, Chicago 37.

WORLD'S Largest Stamp (7½ x 14 inches). A real curiosity! Retail for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 50, Mass.

START your own stamp business. Write for free circular. Donald Shepard, Box 5139, Chicago.

FREE! Complete Balkan aviation set with approvals. Beaman, Leeds 10, Ala.

POPULAR SCIENCE OPPORTUNITIES

128-PAGE United States Catalog. 1,000 illustrations. 10c. Harris & Co., 204 Transit Bldg., Boston.

UNITED STATES approvals complete coverage fine quality. attractive prices. Seminole Stamps, Box 1138-S, Coral Gables, Florida.

200 DIFFERENT, including Roosevelt triangle. 5c to approval applicants. S. Avalon Stamp Co., Springfield, Mass.

A WORLD of Stamps for 10c!! To obtain 1000 new Customers for our approval Service—we offer this stupendous Bargain—Stamps from every part of the World. airmails, pictorials, commems, etc.—A Fine Lot of Stamps for only 10c—Send your dime with your request for our Bargain approvals now. Cosmopolitan Stamp Co., 1457 Broadway, N. Y. C. 18.

50 GREECE plus Albania error 10c with approvals. Chase, 1026 Walker Avenue, Oakland 10, California.

GREAT "\$5.00 Catalog Price For 10c" Offer!! (1) Big collection of 112 all different genuine stamps from Africa, South America, South Sea Islands, etc. Includes Airmails, Triangle and Animal Stamps; many others. (2) Four scarce unused United States. Catalog price 40c. (3) Fine packet 25 different British Colonies—Burma, Hong Kong, Solomon Islands, etc. (4) U. S. \$5.00 high value. Total catalog price over \$5.00! Everything for only 10c to approval applicants! Big lists of other bargains given. Crystal Stamp Co., Littleton 17, N. H.

200 BRITISH Empire Stamps—only 3c! Kenmore Stamp Co., Arlington 74S, Mass. Free—Illustrated Catalog! Kenmore Stamp Co., Arlington 74S, Mass.

"UNITED-STATES" collection—Thirty-seven different unused commemoratives including Columbians 1893-1943 issues only. Price \$1.00 approval applicants only. "Stamps," Box 87S, Albany 1, New York.

FREE! 200 Commemoratives, Flags, Airmails—including error—\$2.50 value! Approvals. National, Box 42F, Passaic, N. J.

LIBERIA set 3 airplane triangles, plus stamps cataloging \$1. Only 3c. Approvals. Moublow, 740 Hegney, Bronx 56.

"33 PICTORIALS—16 Foreign Countries—10c With Approvals. Bryant Company, Fairhaven, Mass."

POLISH mints 213, 214-Hitlers—\$1.00. Approvals. Robert Barricklow, Box 25, St. Clairsville, Ohio.

AMAZING Bargain 25 Vaticans Only 10c. Wilhelm, 14646 58th Road, Flushing 2, N. Y.

FREE. Triangle. Roosevelt. Vatican Ethiopia. Hitler Heads. Request Approvals. Florida Stamp Company, Box 807, Miami 5, Fla.

FREE—U. S. Commemorative Price List. Historical Stamp Co., 1284 Ocean Ave., Brooklyn 30, N. Y.

FINE Approvals. Fast, personal service. What countries do you prefer? I'll send their stamps. Milton Skinner, 438 Locust, Long Beach 12, Calif.

FREE. Irish commemorative collection, including Rebellion issue with approvals. Raymax, 123-X William St., NYC 7.

31 DIFFERENT with George Washington Stamps, from Brazil and Ecuador; Pirate Island; Victory issue; Medical set; others—all 4c with approvals. Grayson Stamps, Sherman, Texas.

FREE! Tiny Chinese "Midget" War set. Approvals. Seminole, Leeds 10, Ala.

POSITIVELY Greatest Free Offer—Rare Octagonal (eight sided) stamp, gorgeous diamond, giant triangle, also mammoth and midget stamps, total value \$2.00. All Free to approval buyers. Plus Free, Scott's International \$6.00 album and latest Stamp Catalogues. Odd Stamps, P. O. Box 510, Bell, California.

FREE! Negro Triangle; Turks Islands "Cactus"; Dakar; Guinea; Palestine; "Fairy Tale." Pirate Chart, Map, Ship, Sea Lion and Snake stamps; French, British, Portuguese Colonies, etc. Free for 3c postage. Approvals. Potomac Stampco, Washington 10, D. C.

VICTORY Packet Free—Includes stamps from Tanganyika—British Cayman Islands—Animal—Scarce Babyhead—Coronation—Early Victorian—Airmail—Map Stamps—Including big illustrated catalogue. Send 5c for postage. Gray Stamp Company, Dept. P. R. Toronto, Canada.

WORLDWIDE Different: 200—25c; 500—50c; 1000—\$1.25; 2000—\$3.25; 5000—\$15.00. Beacon Sales, Maynard 3, Massachusetts.

U. S. 797 SPA Sheet only 5c to applicants for U. S. approvals. M. Haycock, 333—86th St., Brooklyn, N. Y.

FREE! Asia, Africa, Europe Packet. Approvals. Standard, Box 43 West Farms, New York 60, New York.

BRITISH, Spanish, French Colonies, Vatican, Hitler heads, and airmail packet, free with approvals. Pan-American Stampco, Box 145, New York 33, N. Y.

OLD, scarce U. S. seconds on approval. Slightly defective, bargain prices. Hearnfeld, Clintonhill Station, Newark 8, N. J.

FIJI included! Stamps from 40 countries 10c. Elzea, Bowling Green, Ohio.

100 STAMPS, Album, Gauge—25c. Box 6618, Northeast, Kansas City, Mo.

1946 SARAWAK "White Rajah" Commemorative, plus Eastern Rumelia, Italian East Africa, Cilicia, Southwest Africa, Kwangchow, Everything 3c with approvals. Viking, 130-PP Clinton St., Brooklyn, N. Y.

PENNY Approval Bargains. Write Dept. PSM, 1267 Tutwiler, Memphis 7, Tenn.

25 DIFFERENT Denmark sent to approval applicants enclosing 3 cents postage. G. D. Durden, Box 846, Orlando, Fla.

25 DIFFERENT stamps 10c. F. Tunis, Wakeman Ave., Newark 4, New Jersey.

ILLUSTRATED U. S. Catalog Free! Jarr, Box 217-N Madison Square, New York 10.

15,000 Different Stamps 2c Each! Gordon Davison, Box 1019A, Manchester, N. H.

SPANISH Air set free. Approval applicants. Flamingo, Box 4038, Pinewood Station, Miami 38, Florida.

FREE!! Large assortment fine stamps from numerous countries. 3c to approval applicants. Eastern Company, Box 1295, Grand Central Station, New York 17.

307 ALL Different 10c. You will find scores of new varieties here for your collection! Big and little stamps, bisected stamp, Commemoratives, triangles, High values! Bicolored Beauties! Strange countries! Every stamp is different. All for only 10c to approval applicants. Write today and receive special Ionian Island stamp extra. Garcelon Stamp Company, Box 418, Calais, Maine.

YOU'LL like our American and British Colonial approvals. Write now. Chesapeake Stamps, 748S Overbrook, Baltimore 12, Maryland.

BEAUTIFUL China set nine desirable airmails 6c with approvals. George Richie, 840 Oak, Alameda, California.

"GENERAL Collectors' Approvals. Therese Taber, 1544 East River Terrace, Minneapolis."

500 MIXED stamps and a surprise packet for only \$.10 to approval applicants. Alfred B. Fahsing, Dept. PS, Box 181, Topanga, California.

50 MINT Hitler Heads, \$1.00. Peters, Box 308-A, Hemet, Calif.

APPROVALS! Up to 60% Discount! Bardsley, Arlington Ave., Roslyn, Penna.

LIECHTENSTEIN and Luxembourg Mint Packet. Free. Approvals, Box 1128, Miami Beach, Fla.

GENUINE "Goya Nude" set complete 35c. Approvals. Royal Stamp Company, Tamaqua 2, Penna.

U. S. price list free. S. Stone, Box 52-S, Dorchester 24, Mass.

BETTER U. S. approvals, used or mint. Panther Stamp Service, Dorchester 24, Mass.

MOZAMBIQUE triangulars, unused. Set 10c with approvals. Vargo Stamps, 6044 South Fairfield, Chicago 29, Illinois.

21 AMERICAN Flags on one large stamp plus 5 handsome sets. With approvals 5c. Arthur Wirth, Norwichtown 2, Conn.

FLAG Stamp Free With U.S. Approvals. E. Wenigman, 929 Oakdale, Chicago.

50 DIFFERENT United States 10c Price list free. Seidenberg, Cassopolis, Mich.

WEIRD—Fantastic. African carved images, leopards, etc. included in big packet Belgium and colonies stamps. 5c if you request approvals. Frazer, Box 4600, Portland 2, Oregon.

10 U. S. Over 40 years Old 5c Approvals. Scott, Middle St., Lexington, Mass., 73.

FIRST day covers on approval. Bob Knobel, 1918 S.W. 12th Street, Miami 35, Florida.

CROATIA Set Complete. Free. Approvals. Thode, 14302M 119 Avenue, So. Ozone Park 20, N. Y.

ANYTHING new? Yes sir. Gibson's Foreign approvals. Robert Gibson, Yoe, Penna.

FREE Croatian Pavelich Set. Reasonable Approvals. Stamp Sales, 227 E. 39 Street, Brooklyn.

GIANT bicoloured royal visits. Malta pictorials, gorgeous Guianas Goose Airmail, Scandinavian packet and illustrated stamp publication 10 cents with approvals. Crown Stamps, Box 331, Toronto, Canada.

VALUABLE Stamp Wallet free with approvals. Granada, 4891-A Southwest 5th Street, Miami 34, Florida.

APPROVALS! Low Priced! Premiums! Marjay, Box 14, Brevoort, Brooklyn 16, N. Y.

POUND stamps containing thousands \$1.00. Longacre Shop, 100c West 42nd, New York City 18.

ROGUES Gallery Packet. Hitler-Mussolini. 30 others. 3c. Premium, Hartland 6, Me.

FINE Foreign stamps at fair prices. Intercontinental Stamps, Englewood 4, Florida.

TRADE your duplicate stamps the New way. Complete details and New Issue News Free. Stamp Trader, 12660 Laing, Detroit 24, Michigan.

\$1500.00 NEW Chinese Colorful Commemorative Set—Free with Approvals. Gerhart, 2804 Riogrande, Austin, Texas.

APPROVALS. You name them, I send 'em. Satisfaction guaranteed. George Magner, Wellesley, Mass.

FREE: China Confucius issue to collectors requesting foreign approvals. Modern Stampco, Box 12A, Wakefield Station, N. Y.

TRIANGLES! Diamonds! Octagons! Midgets! Giants! Roosevelts! Hitlers! U. S. \$1.00-\$5.00. Stamps! Stamp Magazine! Everything 10c with Approvals! Thrifty Stamps, Silver Spring, Maryland.

BERLIN Bears. Complete set of eight and 100 different stamps only 10c to approval applicants. Reich Stamp Co., 4647 Kenmore, Chicago 40, Ill.

STAMP Buyers' Guide (Box 1649F, Oakland 4, California), plus 50 different Chinese stamps, for 10c.

AUSTRIA, Belgium, Germany, Mint and Used on approval. Henry Zimmer, 722 Culver, Rochester 9, N. Y.

75 STAMPS from 75 countries 10c to approval applicants only. Bjorn Nielsen, Monmouth 1, Maine.

FREE China Airmail Set with Approvals. Fields, 1939 E. 85, Cleveland 6, Ohio.

100 ALL Different stamps from China! Only 10c. Approvals. Star Stamps, Jamestown, New York.

42 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 2926-Eye St., N. W., Washington 6, D. C.

50 DIFFERENT army embroidered patches \$1. Other bargains. Insignia Mart, 703B Broadway, New York 3, N. Y.

HOBBYISTS: Send 25c for biggest value in hobby catalogs. 64 pages. 500 illustrations. Materials, books, tools, kits for 26 hobbies. Jar Hobby Mart, Dept. C11, Box 137, Iselin, N. J.

10 ANCIENT Arrowheads, \$1.00. Peace Pipe, \$5.00. List Free. Lear's, Kirby, Arkansas.

VENTRILOQUISM Taught. 3c stamp brings particulars. Smith, 801 Bigelow, Peoria 5, Ill.

POPULAR SCIENCE OPPORTUNITIES

UNPAINTED Plaster Ornaments. Easily decorated with water colors or oil paints. Profit or Hobby. These Are Good. Free Illustrations and Lists. Midwest Novelty Manufacturers. 524-B E. Park. Anaconda, Montana.

UNUSED matchbook covers—100 different \$1.00—Free catalog—Charles Edelman, 1311P East 84, Cleveland 3, Ohio.

46 MINERALS & PRECIOUS STONES

ZIRCONS. loose. Pure white. Special 3 Zircons approximate total weights 3 kts. \$6.00. We can supply Zircons in all sizes and mountings of all types. Send order or write for details today. B. Lowe. Holland Bldg., St. Louis, Mo. PS.

"GENUINE" deep red Arizona Rubies (Garnets). Send quarter for packet. Mineral Specimens Company, Box 2651. Phoenix, Arizona.

GEMS. precious and semi-precious. all genuine from world wide sources. Deal direct. no overhead. save money. Catalog 10c. Hill Co., Route 7-K. Salem, Oregon.

GEMSTONES. rough, polished. Crystallized specimens. Every variety. lowest prices. List free. Plummer's. 5068 Brighton. San Diego 7. California.

ARIZONA Gem Stones. polished. ready for mounting in rings, bracelets. \$1.00 each. Miller. 3627 East Van Buren. Phoenix, Arizona.

SLAB Plume Agate \$1. Rockhound. Box 555. Grand Junction. Colo.

47 CAMERAS, PHOTO SUPPLIES

BASS says! At the sign of the old "Horse Trader." 38th year. Thousands of satisfied customers everywhere! Finest brands including Kodak, Bell & Howell, Argus, Zeiss, Leitz, etc. Satisfaction always guaranteed or your money back! Bass buys 'em, sells 'em, trades 'em. Write or wire. Bass Camera Company, Dept. AG, 179 W. Madison St., Chicago 2.

8-16mm MOVIE Film in bulk for home processing. Big free catalog bargains in film, processing equipment, supplies. Superior. 105A S. Wells. Chicago 6.

PROJECTORS. Cameras. Photographic Bargain List Free. Selco, PS11, Danvers, Massachusetts.

YOUR prized negatives make beautiful photo enlargements easily. economically with the new Precise Photo Enlarger. only \$22.20 complete. nothing else to buy. Send postcard for details. Tam Products. CS-11. 3814 Wrightwood. Chicago 47.

YOUR every requirement met by the new Precise All Metal Enlarging Easel. only \$7.50 complete. Nothing finer at any price. Send postcard for details. Tam Products. ES 11. 3814 Wrightwood. Chicago 47.

FLASHGUN Surplus. Close-out of nationally known manufacturer. Durable. sturdy. all perfect condition. Five different models. For Brownie 620 Special. was \$3.98. now \$1.98; for Brownie Reflex. was \$4.49. now \$2.49; for Ansco Rediflex. Pioneer or Chief. was \$4.49. now \$2.49; for cameras with synchronized shutters such as Kodak 35. Vigilant, etc., was \$7.95. now \$2.98; for cameras with self setting shutters using cable release socket. was \$8.49. now \$3.49. Brand new in original factory cartons. Limited supply. Mail order Surplus Outlet. 517 Northwestern Bank Building. Minneapolis, Minnesota.

200X TELEPHOTO camera easily made. Trifling cost. Telephoto lens and instructions \$3.00. Instructions alone 10c. Suffolk Science Service. Box 408. Manorville, N. Y.

48 PHOTO FINISHING

18 CHRISTMAS Cards and envelopes \$1.00. 60—\$3.00. send negative. Three prints each 8 exposure roll 40c. Two each 35c. One each 25c. Reprints 3c. Fred A. Eastman. Bode, Iowa.

BEAUTIFUL enlargement from each picture on roll 30c. Cut Rate Photos. Dept. A 6. Janesville, Wis.

OIL coloring photographs can be a fascinating hobby or profitable sideline for those with artistic talent. Learn at home. Easy simplified method. Send for free booklet. National Photo Coloring School. 1315 Michigan. Dept. 172C. Chicago 5, Ill.

3 PRINTS all enlarged to nearly postcard size from your roll or negative 25c; 16—50c. (Trial offer) Willard Studios. Box 3535G. Cleveland. Ohio.

NEW Process developing and printing. 8 exposure rolls 35c. Mayfair Photo Service. Box 261-A. Toledo. Ohio.

TWO beautiful prints from each picture on roll 30c. Twenty-seven years of satisfied customers. Quick service. Lens Photos. Dept. J 9. Janesville, Wis.

SENSATIONAL Introductory Offer! Send snapshot or negative. this ad and 10c. We'll send you a beautiful 7 x 5" enlargement! Or. Kodak roll developed and printed (with free coupon) only 25c; or 8 Giant prints from roll. 30c. Reprints from negatives—any quantity—regular size. 3c; Giant size 4c. Candid rolls—36 exp. 35mm developed. vaporated. enlarged to 3 x 4. \$1.00. 18 exp. 50c. Free Mailers. Free Premium offers sent on request. American Studios, Dept. 365. LaCrosse, Wisconsin.

WHY not pay a little more and get the best? Automatic machine development. Electronic exposed prints in album form. 8 exposure rolls—50c—over 8 add 5c per exposure. 35 years in business. Hifoto-B. Box 2133. Cleveland 8. Ohio.

ROLLS developed and printed in newest continuous strip. 8 exposures—35c—12 to 16—50c. Hitone-B. Box 2426. E. Cleveland. Ohio.

ROLLS developed—8 prints—one 5 x 7 enlargement. 35 years in business. Sterling. Box 2442-B. E. Cleveland. Ohio.

ENLARGEMENTS 5x7 15c. 8x10 25c. Glossy or dull. Gorgeously oil colored 50c. Rolls developed and printed 25c. L & R. P. O. Box 1476B. Milwaukee, Wisconsin.

8 BEAUTIFUL Double Size pictures and roll developed 30c. 8 hour service. Free Mailers. Pacific Photo Service, Box 666. San Francisco. Calif.

2 BEAUTIFUL Hi-Gloss prints each good negative and enlarging coupon with each 6 or 8 exposure roll developed 28c. Owl-photo Co., Weatherford, Oklahoma.

YOUR favorite photograph or drawing reproduced on Photo Post Cards. Send to friends and relatives. We copy any size original. \$1.50 for 12 or \$3.50 for 50 post cards. Missouri Post Card Co., 2335 Brown Road. Overland 14. Missouri.

51 MOTION PICTURES, SOUND EQUIPMENT

"BASS says! 38 years of leadership means satisfaction to you! Finest equipment. 8 and 16mm. sound cameras. sound projectors. Bass buys 'em, sells 'em, trades 'em. Satisfaction always guaranteed or your money back! Bass Camera Company. Dept. A. 179 W. Madison St., Chicago 2.

MOVIE Film Processing—Finest Automatic Machine Processing. 8mm. 16mm. 48 hour service. Also duplicating, editing, titling, other lab. services. Send for list of prices. Fotoshop Inc., Room 246, 18 E. 42nd Street. New York City 17.

KODAK Super-X Movie Film at Give Away Prices! Gov't. Surplus but Good as Gold! Tested and fully guaranteed. 16mm 100' \$2.95; 50' Magazine \$2.50; 8 mm 25' Double 8 \$1.65. Processing included. Stock Up Now! Fotoshop, Room 270, 18 E. 42nd St., New York City 17.

MOVIE Film at Tremendous savings! Kodak Super X. Gov't. Stock. Tested. Guaranteed! 16mm 100 ft. \$2.95; 50 ft. Magazine. \$2.50; Double 8mm 25 ft. \$1.65. Super XX. 50c add'l. each roll. Free Processing. Fast Service. Photo Surplus Sales. Box K-17, 12 Duane St., New York City.

ELECTRIC Movie Cameras. 16mm. Army GSAP original condition. Value \$200. Complete with f/3.5 lens New \$32.50. Used \$19.50. Accessories available for home conversion. Free literature. Completely converted Lektro, 16mm. Ready-To-Operate \$59.50 Guaranteed. Magazine film for same. \$2.50. includes processing. Fotoshop, Room 222 18 E. 42nd St., New York City 17.

8-16MM. Silent-sound films. Complete rental library. All latest subjects. Free catalogue. (sample film 10c). Garden Film, 317 West 50th. New York 19.

SOUND features shipped. rental \$3.95. 1,600' shorts. \$2. Free catalog. National Cinema Service, 71 Dey Street, New York City.

HOLLYWOOD films. Color sample. \$1.00 (refunded). Catalogs 10c (refunded). Stone, Lunenburg 10. Mass.

UNUSUAL 8-16mm. film subjects. Art slides. Films exchanged. Big catalog with sample film. 25c; refunded first order. National Film Supply. Broadway Sta. (E). Toledo 9. Ohio.

8 16MM FILM Specialties. Catalog dime. Warrington Films. 1418 Knecht Ave., Halethorpe 27. Maryland.

BENEFIT'S Strip-O-Slides. now available. Needed by every artist. 25 Art Studios in life-like color. on 35mm Film Strip complete with 25 ready mounts. Only \$2.95 postpaid. (Add 10c for first class mail.) Series 1. 2. 3. 4. now available. Extra Special Viewer for \$1.50 when ordered with Strip-O-Slides. Benefit Corporation, Dept. A511. 3807 Benefit St., Baltimore 24. Md.

MOVIE film. machine processing service. bulk film. free literature. Atlantic Films, Reading, Pa.

BARGAINS in good used 16mm. sound films. Complete one reel subjects often available at \$2.95. List for stamp. Blackhawk Films, Davenport, Iowa.

HOLLYWOOD Novelty Movies. 100 ft. 8MM—\$5.50. 100 ft. 16MM—\$6.00. New Free List for Artists and Home Movies. Novel Films. 3707 Eastern Avenue-PSM, Baltimore 24. Md.

ART Movies 100 ft. 8MM—\$5.50. 100 ft. 16MM—\$6.00. Kodak Super X 50 ft. 16MM magazine \$2.20 Ea. 5 for \$11.00. processing included. Free List. Camera Place. 3707 Eastern Avenue-PSM, Baltimore 24. Md.

BRAND new 16mm sound projectors \$129.50. Send 10c for 1948 photographic catalogue. Sterling's. 679 Northampton. Easton, Pennsylvania.

RENT 16 mm. sound films 50c reel. Large selection; free catalog. U. C. Film Service, 128 Chestnut St., Roselle Park, N. J.

GUARANTEED fresh anti-halo outdoor movie film! Weston 12! Daylight loading! Processing free! Three spools double 8mm. \$3.45! Six single 8mm for Univex. \$4.60! Postpaid! Catalog. Eso-S. 47th Holly, Kansas City 2. Missouri.

8mm SOUND projector for the price of a silent machine. Write Standard Sales, Box 7525. North Kansas City, Missouri.

LEARN movie projection, management. Free Catalog. Theatre School. Elmira, N. Y.

16-35 mm. SILENT Sound Films. Bedner. 5300 So. Talman, Chicago.

FREE movie list. Superior Film Service. Box 713. Troy, N. Y.

EXCLUSIVE Movies. Glamour. Sports. Projectors. Screens. Slides. Free Catalog. Home Pix. 1674 Broadway. New York 19.

"THE World's Greatest Passionplay." State Projector. 16mm. & 35MM. Sound & Silent. Hemenway Film, 33G Melrose St., Boston 16. Mass.

ART Films and Art Slides—Study the grace and charm of the feminine figure right in your own home. These art films catch the intimate beauty of the female form. For everyone who enjoys true beauty and for artists and art students who wish to capture the lovely, natural rhythms of movement—there are hundreds of different films. Write for complete listing. Specify 8 or 16mm. Camera Corner, Box B. 391 Bridge Street, Brooklyn, N. Y.

PARTY films 8mm-16mm latest Hollywood productions. Send for free lists. Varieties. Dept. B. Box 8493. Cole Branch. Los Angeles 46. Calif.

SAVINGS! Movie equipment. Bargain bulletins 10c. Towers. 935 North 40th, Philadelphia 4.

FILM—Free processing 100 ft. 16mm. Weston 12 \$3.25. Weston 24 \$4.90. Weston 64 \$4.95. 25 ft. double 8mm. Weston 12 \$1.50. Weston 24 \$1.89. Weston 64 \$1.99. Free Circulars. Fromader Genera. Davenport 5. Iowa.

WE Buy. Sell. Rent. Exchange Home Movies. Details for dime. Midland. Box 429. Oak Park 3. Ill.

GIRLS. travel. adventure. cartoon films. Catalog dime. Bailey Films. 2044 North Berendo. Hollywood 27. California.

FREE Movie Catalog; sample films 10c. Goodwill Company. Jackson, Tennessee.

POPULAR SCIENCE OPPORTUNITIES

16 M/M SOUND Films for rental to schools, churches & private parties. The subjects are Operettas, Musicals, Westerns & Cartoons at an attractive price. Martin Bahnsen, 146-24 North Hempstead Turnpike, Flushing, N. Y.

"ORIGINAL 2 x 2 color slides of high-heel, silk stocking models in breathtaking color. Sample 50c—Sequence of five—\$2.00. Color Center, Box 488, Port Washington, N. Y."

52 MUSIC, MUSICAL INSTRUMENTS

VOICE! Subconscious! Control! Literature! Mr. Cor, 14356 E. Jersey, Norwalk, California.

"SWISS Musical Units \$3. Musical Albums, Boxes, 131 West 42nd, New York 18."

SWISS Music Movements Assorted Tunes \$1.90 Direct From Manufacturers Agent. Helax Company, 233 West 72 Street, New York.

PHONOGRAPH Records 20c. Catalogue. Paramount, S-313 East Market, Wilkes-Barre, Penna.

53 SONG WRITERS

POEMS Wanted to be set to music. Free examination. Send poems. McNeil, Master of Music, 510-PS, S. Alexandria, Los Angeles, California.

SONGWRITERS. Songs Published Monthly Advance Royalty. Send your songs or poems today for our exciting offer. Hollywood Tunsmiths, Dept. 10F-C, 1537 N. Vine, Hollywood 28, Calif.

\$1,200.00 PAID Yearly to new songwriters. Opportunity for publication and advance royalty. No charge for melodies. Records, lead sheets furnished. Send song material now for free examination. Get details. Cinema Song Company, Dept. B-63, Beverly Hills, California.

SONGWRITERS: Send Poems for Free Examination and Outstanding offer. United Music, 116, Salem, Indiana.

POEMS Wanted For Musical Setting. Send poem for free examination. Five Star Music Masters, 646 Beacon Bldg., Boston.

POEMS wanted for musical setting. Send poems for Free examination. Hamann Service, 626 Manhattan Building, Milwaukee, Wisconsin.

WHAT creates composing genius? Accurately stimulated musical thinking. Composers, arrangers, songwriters, conductors, instrumentalists, employ renowned Stackpole harmonization chord chart and staffless music shorthand. \$1 brings you both these knowledge tools. Paul Stackpole, 2112 West Venango, Philadelphia 40, Pa.

POEMS Wanted for musical setting. Send poem for immediate consideration and Free Rhyming Dictionary. Richard Brothers, 46 Woods Building, Chicago.

SONGWRITERS! Outstanding ethical offer. Hibbeler, C15 2157 N. Avers, Chicago 47.

SONGWRITERS—Protect your songs. Get the facts first. Free booklet, attractive offer. Song Service, 331-J West 46th, N. Y.

HONEST outstanding music writing offer. Len-Tex Studios, Leonard 3, Texas.

INFORMATION! How to write songs. How to get it published with 12 complete songs \$2.00. J. Dayotis, 1658 Broadway, New York 19, N. Y.

SONGWRITERS Attention: Enter our nationwide contest to find new hit song. Composer of winning song will receive regular songwriters' contract with \$100.00 advance royalties. Winning song will be published without any charges whatsoever. Send today for official entry blank. Greenwich Music Company, Inc., 1697 Broadway, New York 19, New York.

54 RADIOS, SUPPLIES & EQUIPMENT

MAKE Simple, Tubeless, Batteryless, Distance-Getting Crystal Radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-S, Clinton, Mo.

BE your own boss! Start a money-making radio mail-order business. Absolutely no experience necessary. We show you how. Real opportunity for big income. More information free. Merit Products, 216-32E 132nd Avenue, Springfield Gardens 13, N. Y.

RADIO Made Easy! A method of radio repairing that can be learned quickly—Begin repairing immediately. Increase your income now—Send for the JRI Home Trainer Today! \$2.00 postpaid or plus C.O.D. charge. Satisfaction guaranteed. The JRI Trainers, P. O. Box 2091, Dept. 42, Chicago 9, Ill.

FREE radio and television catalog! Money saving prices on radios, hard-to-get-parts, record changers, wire and disc recorders, amplifier systems, tubes, books, amateur and test equipment. Write today! Radionic Equipment Co., Dept. 1511, 170 Nassau Street, New York 7, N. Y.

MAKE "Loudest" Crystal Radios. Instructions, Loudest Crystal, Catalog: 25c. Amorose's, Route Four, Richmond, Va.

"26 YEARS Experience Radio Repairing at your fingertips. I've repaired 45,000 radios. Have perfected simple system you can follow step by step. No calculations or formulas. Total price \$2.00 postpaid or C.O.D. Money back guarantee. Ross Radio, 14615-N Grandriver, Detroit 27, Mich."

BARGAIN Radio Parts List Free. Al's Radio Service, Sioux City 7, Iowa.

RADIO Tubes, Surplus Radio Equipment, Bargains. Ask for List. Kay Electronics, Hollis, New York.

24 PAGE Crystal Plans, "Radiobuilder"—25c. Laboratories, Eye-t, San Carlos, California.

MAKE Crystal radio "Boosters." Free instructions. Radio Leader, LaVerne 6, California.

BUY Everything at Wholesale Prices! Radio parts, equipment for the amateur, service man and experimenter. Lowest prices anywhere. Write Mid America, Dept. 2412 S. Michigan, Chicago 16, Ill.

RADAR Crystals, Supersensitive. Free details. Communications, 110-Q University, Seattle 1, Wash.

56 BUSINESS OPPORTUNITIES

\$25 WEEKLY working two hours daily. No canvassing. No Manufacturing. Lycke, Box 2471, Cleveland 12, Ohio.

RECAST old batteries into new. Latest achievements. Battery Laboratories, Minneapolis.

SPECIALTY Manufacturing, the big money business that can be operated anywhere, start on a very small capital; we supply dependable formulas and complete instructions; get interesting Free booklet, "Money-making Opportunities in Specialty Manufacturing." Howard Robinson, Ph. G., 1300-B S. Ohio St., Sedalia, Mo.

137 PLANS to make money local, mail order. Particulars free. Elite Co., 220-A Grand St., N. Y.

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late methods. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. E, Decatur, Illinois.

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

START Sewing Machine business by electrifying and converting to portables. Free details. Pasaak, Dept. PS, Pauling Ave., Tappan, N. Y.

NO selling, operate vendors, amazing profits, details Free. Factory Silver-King Corp., 622 Diversey, Chicago, Ill.

A FACTORY in your home garage! Mfg. and sales rights, mechanics' waterless hand cleaner, \$500-\$800 monthly. No special equipment necessary. Formula free. Western Aircraft Mfg., Dept. G, Los Angeles 6, Calif.

MAKE money sharpening saws at home on electric machine. No experience necessary. Hardware dealers act as your agents to secure work. Send for Free Book "Independence After 40" shows complete plan for starting in spare time. Foley Mfg. Co., 48 Foley Bldg., Minneapolis 18, Minn.

\$10.00-\$20.00 WEEKLY, spare time. No canvassing. Free literature. Teepee Co., Cleveland 3, Ohio.

START Mailorder Bookshop—Everything furnished. 25c brings booklet, samples, exciting ideas. General Publications, Ossining 1, New York.

VENDING Machines earn big money! An investment as low as \$10.50 will start you in this fascinating, profitable business that can lead you to the road of success and independence. Routes can be established and operated in either full or spare time with no experience needed. Write for full details and our free catalog illustrating our nut, candy, gum and stamp vendors; also slot machines, amusement games, etc. Parkway Machine Corporation, 623 W. North Avenue, Dept. 9, Baltimore 17, Maryland.

HOME Business making statuettes, plaques, artificial marble flooring, rubber molds, metallizing baby shoes. Amazing profits. Folder free. Creative, 236-M, Winnetka, Illinois.

NEW method of casting metal toys and novelties opens opportunity for full or spare time business and profits. Latest 1948 scale model autos, original ashtrays, savings banks, water pistols, etc. easily cast with bronze moulds. Big wholesale and chain store Xmas orders now being placed keep manufacturers busy. No experience or special place necessary. Write for details and illustrations of patterns needed. Metal Cast Products Co., Dept. E, 1696 Boston Road, New York 60, N. Y.

MAIL order offers increased income, independence, unlimited possibilities. Free literature. Manhattan House, 126S Lexington, New York 16.

MAKE At Home beautiful Jewelry, Gifts, Novelties, from Sea Shells, Plastics. No tools or experience needed. 60-page beautifully photographed instruction course \$1.00. Beginner's 6-piece jewelry Kit \$3.00 (foreign \$4.00). Information free. House of Gifts, Box 4550-PE, Coral Gables, Fla.

EARN more money. Read Dollars and Sense Picture Trade Magazine. Sample dime. Martin, 57 Hart, New Britain, P.S., Connecticut.

BUY the new Concession popcorn machine. Biggest low priced popper on market. \$100 puts you in business, complete. Also caramel corn, candy floss, candy pullers, kettles, heating equipment. Write for new catalog. Concession, Dept. B, Toledo 6, Ohio.

OWN Mirror Shop. Resilver Mirrors. Glass Sign Making Electroplating. Supply Prices. John Sprinkle V90, Marion, Ind.

SELECT Collection Money Making Plans. Local-Mail Order. Sixth Edition. Particulars Free. Flasco Sales, 2505PN 150 St., Flushing, New York.

I'LL Put A "Shoe Store Business" in Your Pocket! Nation's Leader trains you to make Big Money! Fit men, women. Free Sample Outfit—Write Today! Consolidated Shoe System, Dept. S-214, Chipewa Falls, Wis.

MAKE money making new greaseless doughnuts at home on electric machine. Wholesale to grocers, drug stores, cafes, hamburger shops. Send for free recipes and plans. Ray Do-Nut Company, 3605 South 15 Ave., Minneapolis 7, Minnesota.

PERFUME—Make it yourself. Profitable, sparetime, home business for men and women. Free information tells how. Write "International," 6347 Parnell-P-11, Chicago 21, Illinois.

COLORGLAZED Concrete Pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, Minnesota.

USE your home as magazine subscription station. Represent all magazines. Liberal Commissions—we supply everything. Big Christmas business ahead. Catalog, full details, free. McGregor Magazine Agency, Dept. 13, Mount Morris, Illinois.

PLASTIC Tablecloth Covers, Curtains, Drapes, Baby Pants, Bowl Cover and other Plastic Articles selling like wildfire! Make big money now! Free Details. Write L & M Co., Dept. 59-K, 510 St. Charles, St. Louis, Missouri.

LIQUID Marble—make in any color. Soundproof plastic flooring. Flexible molds. Cast novelties, plaques, statuary. Big Money—your own business. Catalog free. Write—Bing Products, 88-B-11-A Broad Street, Boston 10, Mass.

POPULAR SCIENCE OPPORTUNITIES

TRAVEL Anywhere: Anytime. Earn \$85.00 week up. No experience necessary. Literature free. Travel, LaGrange 2, Ind.

OWN-operate Cigarette Vending Machines in hotels, taverns, garages, etc. 6-column machines, price \$59.50 each. 9-column machines, price \$90.00 each. Peanut and Ball Gum Machines, \$13.95 each. Immediate delivery. Write for free circulars. Cameo Vending, 432 West 42nd St., New York.

IF you work in a factory or shop, you are passing up the opportunity of a lifetime to build a steady Extra Income by selling subscriptions to Popular Science Monthly to your fellow employees. For Free kit and complete instructions write on a postcard to—Manager of Agents, Dept. A148, Popular Science Publishing Co., Inc., 353 4th Ave., New York 10, N. Y.

POPCORN Machines. Potato Chip outfits. Long Eakins Co., 4863 Hi St., Springfield, Ohio.

WANTED Mail Order enthusiasts. I get you started in your own business. Write Frank Audino, 1465 West Eighth Street, Brooklyn 4, New York.

ATTRACTIVE Lapel Gadget with Order for Kit—Instructions and Material \$1.00. Profitable Hobby. Helen Zaleski, Box 81, Rangely, Colorado.

PROFITS selling office supplies by mail to business firms. Particulars free. Glenn Snyder, 5-F Spring, Beachwood, N. J.

TRADE Magazines help you get ahead. Latest single copies. Over 1000 covering every trade, business and interest available through our easy-to-get-acquainted service. Full particulars and price-list free. Commercial Engraving Publishing Co., 34S North Ritter, Indianapolis 19, Ind.

BIG money. Spare or full time in your home. No Selling! Spray New Miracle Finishes. Plush, and Suede, on signs, radios, automobiles, figurines, lamps, toys, etc. Our business is booming—new easy Flok-Kraft methods—material costs few pennies. You get dollars. Free samples, complete powerful money making plan free. Write now: Coast, 1511 West Manchester, Los Angeles 44.

MAKE \$10.00 weekly, spare time. Experience unnecessary. Details free. Carter, 3935 Ottawa, Minneapolis, Minn.

LEARN Piano Tuning. Repairing at home. Tremendous field! Piano parts, tools furnished. Established 1935. Empire School, 606-A University, Champaign, Illinois.

MAKE Rubber stamps, metalize baby shoes, silver mirrors. Make plaster Novelties. Catalogue of "20 Ideas" Free. Universal, Box 1076-B, Peoria, Ill.

LIQUID Rubber, make flexible molds. Free Sample. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

QUICK Money! "Repairing Car Batteries." At home! Easy tool Write, Batterymen, Grand Junction 1, Colorado.

NATURAL molding latex. Extra thick. Free Sample. W. Wooley, 115-B Donald, Peoria, Illinois.

STATE And Local Distributors wanted for complete line guaranteed paints. Full or part time. two-way plan: Straight commission paid with order, no investment; or start retail store on small capital. High year-round income. Standard Industrial Products, Dept. PS-11, Evansville 4, Ind.

GET it for them wholesale. Be neighborhood buyer nationally-known merchandise; radios, appliances, etc. Start spare time. This pleasant easy work can earn \$5,000 year. Free information. Cox, Saugus 9, Massachusetts.

BABY Shoes preserved. Formulas. Instructions \$1.00. Supplies & Bases. Novelty Bronzing, Box 56, Hyde Park 35, Mass.

MAILING postcards selling repeat merchandise is profitable. Everything supplied. Details free. Gordon Publishers, Box 23, Pawtucket, R. I.

MAKE \$100 per week or more in a full or spare time baby shoe metalizing business of your own. Write now for free literature on this easy to learn highly profitable business. Joseph B. Kushner, Metal Finishing Engineer, Stroudsburg 2, Penna.

AGENT or state distributor for cigarette lighter mfg. MacGregor, Tahoe Valley 15, Calif.

MAKE \$5,000 or more a year in advertising. Be your own boss. No experience necessary. Learn how. Write N.A. Advertising, La Grange 6, Indiana.

ENVELOPES addressed accurately, reasonably. Fast Service. We have capable addressers in your city. Glenway System, 5713-Z Euclid, Cleveland 3, Ohio.

SELLING By Mail? Planning To? Want To? You need Mail Sellers' Handbook. Copy 10c. National, Box 88-S, Dorchester 22, Mass.

SAVE. Plastics Directory lists "right" sources for Materials, Molds, Equipment, Incidentals, \$1. Circular Free. Plastics Digest, 2917-A Michigan, Kansas City 3, Mo.

MAKE tough plastic 1c pound. Makes durable floors, walls, roofs. Build charming home yourself—\$150.00 room. Bays Laboratory, Oklahoma City 9.

BIG money is easy! No canvassing or manufacturing. Complete, specific plans, \$1.00. Warner, Room 426, 710 N. Plankinton, Milwaukee, Wis.

START Your Own Business Making Thermo-Plastic Laundry Labels. Dandy Mail Order. Samples and Instructions \$1.00. DeWeese Label Company, Box #373, San Antonio 6, Texas.

BRONZING baby shoes is big business, start your own business for \$3.95, all materials furnished. Metalsealed, Box 2095, Wichita, Kansas.

METAL, Onyx, Plastic mountings for bronzed baby shoes wholesale. 20 styles. Hardening solution. Metallurgists, Box 2095, Wichita, Kansas.

CASH For your idea. 280 manufacturers need inventions, patented or unpatented. List free. Invention Bureau, 208-S Clinton, Oak Park, Illinois.

REAL money making opportunity making Interlocking Concrete building blocks. Rex Products Co., Dept. 21, Piqua, Ohio.

GOODYEAR—Has Natural Malaya 75% heavy brushing rubber for molds. Trial half pint 50c. Write full particulars. Goodyear—Lake Geneva, Wis.

ELECTROPLATE on leather, plastics or metal. Instructions \$1.50. Four ampere plating unit with instructions \$19.95. Eight ampere unit \$29.95. Kissel Electric Products, 431 Sherman, Galion, Ohio.

RUBBER: White liquid rubber! America's finest flexible molding rubber! New! Extra heavy viscosity! Quick drying! Ideal for home, classroom, or industry. Only \$7.95 per gallon. \$2.95 per quart, and \$1.00 per half-pint sample. Parcel post prepaid! Plastercraft Supply Company, 3051 St. Clair Ave., Cleveland 14, Ohio.

FREE Folio—400 Money Making deals. Business plans. Schemes. Formulas. Formico Prod., Box 572, Dayton, Ohio.

MANUFACTURE concrete brick in your spare time at home. Hand operated equipment shows profit up to thirty dollars daily. Write for details. Reed Corporation, Three Rivers, Mich.

\$3.41 PROFIT per hour interest you? Easy, amazing process velvetizes interiors, signs, novelties, radios, lamps at low cost. Free sample. V-Sparks, 1145 Queen Ann, Los Angeles 6.

CAST Novelties for profit! Genuine Latex molds supplied! Fast sellers! Low cost! Catalog free! Castcraft Studios, 2027-S Fulton Street, Brooklyn 33, N. Y.

METALLIZE Baby Shoes. Excellent profits. New system assures success. Free details. Treasures Forever, 89-B Henry Ave., Lynn, Mass.

MAIL Order Jobber. Protected Franchise. Operate part time from home. Send \$3.00 for ten day trial examination. Everything furnished. Tommy Turnipseed, Inc., Box 681, St. Louis, Mo.

MAKE money addressing envelopes. Our instructions reveal how. Glen Glenway, 5713 Euclid, Cleveland 3, Ohio.

PROTECT yourself against mail order losses by reading "Mail Order Pitfalls" first! Only one dollar postpaid! Satisfaction guaranteed. May save you hundreds of dollars. Order your copy today! Better Sales Company, 2139 Clifton Ave., Cincinnati, Ohio.

FREE Folio "Hidden Value in Mail-order". Success Service, Norfolk, N. Y.

MONEY in "Kitty-Kat" Baby shoes complete successful mail plan. No-Co-Ro, Oakland-6-S, California.

NEWEST Christmas Ornaments Brilliant Colors and Designs. Don't Delay. Send \$1.00 for Assortment. The Jonacent Company, Belle Harbor, L. I., N. Y.

SENSIBLE, proven successful mail order way. Write American Letter, New Market 1, New Jersey.

START Home plaster novelty business. Amazing course tells how. Literature free. Kemo-Courses, Dept. B, 4862 W. Catalpa, Chicago 30, Ill.

WOULD you pay 3%—first \$350 made? Color-illustrated book "505 Odd, Successful Enterprises" free! Some offer occasional "day off." Work home. Expect something odd! Pacific, Oceanside, Calif.

EXTRA dollars or a good living with your typewriter. New, exclusive opportunity. Never before offered. Get details now. Schroder, 221 Bush, Covington 2, Ky.

START Real Estate Business... America's Finest Profession Spare Time. Details free. Educational Book Co., 2907 Berwick Ave., Baltimore 14, Md.

INCOME from local information. No selling. Neher Company, LaVerne, Calif.

FREE Colorful Book "372 Unusual Worldwide Business Adventures"! Photos! Pictures! True; Successful. Australia, Africa, South America, New Zealand, Mexico! Not hokum. Operate some at home. Refreshingly "different" plans. Publishers-B, 1199 Oak, Carlsbad, Calif.

BRONZED Baby shoe mountings and supplies. All metal bronze bookends, picture frames, ashtrays, etc. Onyx ashtrays, desk sets, placques. Hardening solution. 30-amp plating rectifiers with powerstat control. \$85.00. Geared motors for agitation \$20.00. Lead lined tanks. Write for list. Hollywood Bronz Supply, Dept. S, 1770 N. Vermont, Hollywood 27, Calif.

\$46 FROM Square Foot Plywood; Jigsaw necessary. Write; Woodart, Bridgewater, Massachusetts.

WHOLESALE Men's Hygienic Supplies! 48 Samples, \$3.00. Acme Sales, Covington 7, Virginia.

SELL \$150.00 value for \$1.00 and make 95c profit. Terrill, Bogard 1, Mo.

MOLD-Makers. Air-cure latex. Sample and instructions on request; also latex for casting rubber articles in plaster molds. Foam latex. Major Chemical Co., 131 Inman St., Cambridge 39, Mass.

WATCHES, all kinds, new, used; retail \$3.65—\$345.00; big discounts; show catalogue, get orders. Brookins, B-1975CL, Little Rock, Ark.

MAKE your own products, details free. Pharmacist, 939 Euclid, Detroit (11).

IT'S Easy to Convert Hand Mowers to Power Mowers with Handy-Dandy Lawn Mower Conversion Kits. Installed on any mower in 3 hours. Used with any small gasoline or electric motor. (Lauson Engines and Pennsylvania Mowers in stock. Immediate delivery.) Kits can be purchased with or without engines. Fits 16 to 20 inch mower. Dealers wanted. LeClaire Manufacturing Co., LeClaire, Iowa, Dept. PS.

SALES organization seeks gadgets, books, products suitable mail order. Ansen Associates, 333 E. 43rd St., N. Y. C. 17.

UNPAINTED Figurines. Illustrated list Free. Oman, 642-S, Broadway, St. Paul 1, Minn.

57 MONEY MAKING OPPORTUNITIES

DETECTIVES Earn Big Money. Experience unnecessary. Particulars free. Waggoner, P-125, West 86th, N. Y., N. Y.

SCHOOL Seniors—Sell classmates America's most beautiful Graduation Name Cards. Largest Selection. 40% commission. Outsell all others. Free sample kit. Printcraft, Dept. P, 1425 E. Elm St., Scranton 5, Pa.

\$1.00 GETS you 21 money-making popcorn, candy apple formulas. We supply equipment. Concession Supply Company, Dept. B, Station "B", Toledo, Ohio.

POPULAR SCIENCE OPPORTUNITIES

NOVEL Action Jigsaw Toy. M. Winter, 4200 Harford Terrace, Baltimore 14, Md.

METALLIZE baby shoes. Further information 3c stamp. Metal Crafts, Box 125-R5, Tampa 4, Florida.

A \$100 a month hobby at home! No soliciting, no mail order, no meeting people. Easy, enjoyable pastime. Details, 25c (Refundable.) Laura Dickson, 1006-PS Elizabeth St., Anderson, S. C.

BE a Notary Public. Largest notary supply house equips you for \$16.97, guarantees your appointment by governor. Honor, prestige. You certify legal papers, collect fees. Easy. At home, office, anywhere. You use official seal made with your name. Notaries needed everywhere. Be one. Write Stationers Exchange, Helotes 19, Texas.

IF you work in a factory or shop, you are passing up the opportunity of a lifetime to build a steady Extra Income by selling subscriptions to Popular Science Monthly to your fellow employees. For free kit and complete instructions write on a postcard to—Manager of Agents, Dept. A148, Popular Science Publishing Co., Inc., 353 4th Ave., New York 10, N. Y.

\$12.00 PROFIT on 25c investment. Free folder. Suproco, Ogema 7, Wis.

START your own business! Big money manufacturing novelties, plaques, statuary. Free catalog. Write Bing Products, 68-B11B Broad Street, Boston 10, Mass.

WIN contest money. General Contest Magazine gives hundreds of tips. Lists current contests and rules. Sample 25c. General Contests, 1609-A East 5th, Duluth, Minn.

WANTED: Men-Women. Interested in earning extra money. Send 25c deposit. (Credited) for details, and gift. Bishop Novelties, Box 877, Milwaukee 1, Wis.

"**MOST Everybody Likes Candy.**" Learn to make in a professional manner. (Our 38th year). Ragsdale Candies, D10, East Orange, New Jersey.

PRIZE Contest Fans Reap Rich Rewards. Enclose 3c stamp. National Contest Bulletin, Box 2685-S, Miami 31, Fla.

SHELLCRAFT! Make beautiful seashell jewelry. Income - or - Hobby! Large illustrated catalog! Supplies, instructions. 10c Postage (Buy Direct From Manufacturer) Pace's, Box 279-S, Bradenton, Florida.

LEARN battery repairing, rebuilding. Battery Bureau, 2227 North 44th St., Milwaukee 8, Wis.

"**WHOLESALE Catalog.**" (Illustrated 10c). Bargains Galore. Stafford, Box 5211PS, Indianapolis 1, Ind.

MONEY Making offers details free. J. G. Schroeder, Box 504-S Anaheim, Calif.

INCREASE Your Earnings: Local Business Opportunities; Mail Order Information; Wholesale Supply Sources Valuable Money-Making Tips; Information. Free details. Rush name. Wilkin Company, Hillsboro 2, Ohio.

EARN \$25 distributing 50 boxes of greeting cards. Over 20 different top quality assortments for Xmas, birthday plus deluxe boxed stationery. Also make extra money taking magazine subscriptions. Details free! Cassell Co., 11A, Elm St., Westfield, New Jersey.

EARN Money Evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle (2), Wisconsin.

WOULD You pay 3%—first \$350 made? Color-illustrated book "505 Odd, Successful Enterprises" free. Expect something odd! Pacific, Oceanside, California.

NO selling, operate coin machines, amazing profits, details Free. Parkway Corporation, Dept. 18, 623 W. North Avenue, Baltimore 17, Maryland.

\$247.50 making new secret device from pre-fabricated surplus costing \$1.50! No experience, machinery. Amazing, indisputable proofs free! Rolls Enterprises, 115 West 16th, N. Y. 11.

58 FORMULAS, PLANS, ETC.

FORMULAS—All kinds. Latest products. Literature free. Kemico, Park Ridge 15, Illinois.

GROW Colorful Metallic Gardens. Formula, 50c. Marshall, Box 5356, Chicago, Illinois.

10,000 FORMULAS and Trade Secrets. Free Literature. Stillmans, 555 Kingston Ave., Brooklyn 3, N. Y.

LABORATORY tested formulas. Lists free. Pont, Box 635-PS, Terre Haute, Ind.

YOU name it! We'll airmail formula. \$1.00. Satisfaction or refund. Brown, 9111A Hoyne, Chicago 20.

59 PLASTICS

NOVEMBER Special. Supply kit including powdered and liquid dyes. Luminous powder and cement. \$1.75 Postpaid. Lucite, plexiglas, sheets, rod, tubes, findings. Free catalogue. Craft Plastics, Somerville 2, New Jersey.

PLASTIC—Sheets, Rods, Tubes, etc. Free List. Plastic Supply Co., 2901 N. Grand Blvd., St. Louis 6, Mo.

LUCITE Plexiglas. Any size sheets. Cost square foot (12" x 12") 1/16" \$.96; 1/8" \$1.25; 3/16" \$1.52; 1/4" \$1.80; 100—\$1.14. Include 10% postage. Almac Plastics, 1150 Broadway, New York 1, N. Y.

PLEXIGLAS—Write for Free Price List. The Unique Glass Shop, 309 Cowardin Ave., Richmond, Virginia.

INTERNAL carved roses, orchids, swans, goldfish, butterflies, etc. Jewelry and gifts. Crystal Floral Novelty Co., Somerville, New Jersey.

PLASTICS, dyes, findings, shells, craft supplies. Catalog, Fabricating manual, 10c. Lucite sample, 35c. Gem-O-Lite, Box 686G, North Hollywood, Calif.

AMAZING liquid plastic pours cold, hardens in half hour. Clear, colors. Expensive equipment unnecessary. Embed photographs, coins, flowers, seashells. Complete kit only \$3.25. Kristalon Plastics, Dept. B-11, Box 29, Wilmette, Ill.

BARGAINS In Plastics. Lucite, Plexiglas, Catalin. Many colors and sizes. Details free. George Plastics, 6938D George Street, Chicago 34, Illinois.

60 CHEMICALS AND APPARATUS

LEARN Chemistry at home, from the House of Winn. Home of Supplies for student Chemists. New idea chemical and apparatus outfits for Home Experimenting. Photographic Scales. Semi-Professional Microscopes and accessories. Send 15c for retail catalogue. Established 1931. John H. Winn, 124B West 23rd Street, New York 11, N. Y.

HANDBOOK for Chemical Experimenters. Hundreds of Experiments; Illustrated. 50c. Experiment Booklet. 15c. Supply Catalog. 5c. Reading Scientific Co., Reading, Penna.

BIG Chemical Value! Only \$3.50—24 different chemicals for home experiments—all neatly bottled. Met & Co., 160 Hillside Avenue, Nutley, N. J.

NEW Laboratory supply catalog of Chemicals and Apparatus. Contains many thousands of items with illustrations. Send 25c. Standard Science Supply Company, 1232 N. Paulina St., Chicago 22.

FREE catalog: Chemistry, mineralogy, biology, physics. Tracey Laboratories, Evanston, Illinois.

COMPLETE Supply Catalog. 10c. Pilgrim Chemical, 348 Edith, Salt Lake City 4, Utah.

LABORATORY Supplies at Wholesale prices. Catalogue Chemicals, Apparatus, etc. 15c. Microscopic Stains 20c. Both for 25c. National Scientific Company, 2204 W. North Ave., Chicago 47, Ill.

CHEMICALS and apparatus for industrial, analytical, and private laboratories. Catalog 10c. Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 7, N. Y.

61 HELP WANTED

ALASKA. The Last Frontier offers unlimited opportunities. \$1 brings government map and Directory listing firms in Fishing, Construction, Mining, Aviation, Fish & Game rules. Homestead data. Alaska Opportunist, Box 883-S, Hollywood 28, Calif.

RELIABLE man with car wanted at once to call on farmers. Wonderful opportunity. \$15 to \$20 in a day. No experience or capital required. Permanent. Write today. McNess Company, Dept. 95, Freeport, Illinois.

WORLD Wide Construction Job Listings published monthly for Overseas and USA \$1.00 postpaid. Global Reports, P. O. Box 883-PX, Hollywood 28, Calif.

INTERESTED In Latin American & Foreign Employment? \$1.00 brings Foreign Service Directory listing Exporters & Importers, Oil, Construction, Mining, Aviation Companies. Hot tips for application. Global Reports, Box 883-S, Hollywood 28, Calif.

IF you work in a factory or shop, you are passing up the opportunity of a lifetime to build a steady Extra Income by selling subscriptions to Popular Science Monthly to your fellow employees. For Free kit and complete instructions write on a postcard to—Manager of Agents, Dept. A148, Popular Science Publishing Co., Inc., 353 4th Ave., New York 10, N. Y.

LONG needed invention. Established company. Every home, factory, store, farm a prospect. Low price, long profit. Exclusive. Fine outfit. No deposit. Local territory. Write 230 R.C. Building, Red Comet, Inc., Littleton, Colorado.

EARN Up To \$520 Month part or full time keeping books for small firms. Simplified System. Write Tax-Saver System, Dept. N, Ft. Worth, Texas.

ABRIDGED directory; 160 companies with foreign projects or interests; \$1.00 cash (C.O.D. \$1.27). Foreign Service Institute, Box 3980, Miami 24, Fla.

62 AGENTS WANTED

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late method. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. G, Decatur, Illinois.

EXCELLENT Sideline for printing and advertising salesmen. Decalcomania name plates in small quantities. Great demand. Also, make money with our line of Automobile Initials and Sign Letters. Free Samples. "Ralco", XL-Roxbury, Boston 19, Mass.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Letter Co., 437 N. Clark, Chicago.

JOBS Open In Selling! Send name, address for Free copy Opportunity Magazine, listing hundreds of companies who need men now, full or spare time. Experience not essential. Opportunity, 28 E. Jackson, Dept. 15, Chicago 4, Ill.

BIG Money Quickly and Easily taking orders for complete line Personalized Initialed Buckles, Belts, Cap Badges, 2,000 Emblems. Fast repeats. Write today. Hookfast Company, Box 480-PS, Roanoke, Virginia.

MAKE more money selling personal initialed individualized belts, buckles, cap badges, tie holders, name plates, 2,000 emblems to choose. Big profits, whole or part time. Write today—special outfit order. Hookfast Specialties, Box 1425, Dept. 7, Providence, Rhode Island.

FREE sample! Big profit opportunity with amazing Glow-In-The-Dark House Numbers, switch plates, pictures, decals, religious articles. Represent large manufacturer. Madison Mills, 303 Fourth Avenue, New York 10, N. Y.

CHRISTMAS Cards! Jobbers' Prices! Fifty different items from 18c to 38c per box. Gift Wraps, Seals, Christmas Tree Windows, Books, Letterheads. Illustrated Catalog Free! Fantus, 436 North Wells, Chicago.

ADVERTISING book matches—Cash in on big demand—sell Union Label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash commissions. Superior Match Co., Dept. P-118, 7530 Greenwood, Chicago.

NEW exclusive Xmas photo greeting cards, amazing value, big profits, approval samples. Spooner Greetings, 115 Chauncy, Boston, Mass.

AGENTS wanted for our coin operated amusement and slot machines in every town and community. Sell—or start your own route. Big profits! Write for free wholesale catalog and deal. Aerobilt Products Co., Dept. 26, 3767 Druid Station, Baltimore 17, Maryland.

POPULAR SCIENCE OPPORTUNITIES

FREE nylons given if Kendex hosiery runs or snags! World's only women's hosiery sold with a written guarantee that amazes everybody. Mere words could not possibly express the almost unbelievable opportunity you now have to make money. Fantastic and "impossible" earnings now become a reality. Can you imagine a guarantee that replaces hosiery regardless if damage is due to use or abuse and regardless whether it is the fault of the hose or the wearer? Here is sales dynamite that will blast your earnings to the sky! Even if you never sold a thing in your life, three magic words: "Guaranteed Against Everything" will open doors for you—will make women listen and will pour money in your pocket. Kendex stockings are not sold in stores, so you have no competition. Complete line includes beautiful sheer nylons; long wearing, durable service nylons; three different lengths; genuine outsize nylons; latest shades; choice of full fashioned with seams or seamless; lowest priced rayons. Also separate complete line of men's hosiery including nylon, lisle, rayon, cotton, mixtures, etc.; plain and fancy; long and short. Thousands of pairs shipped daily. No money or experience needed. Nothing to invest or risk. No samples to buy. Nothing to pay, now or later! Simply write orders. We deliver and collect. Liberal advance cash plus huge cash bonus. Write orders spare or full time; exclusively or as a side line. Become a manager and appoint others to sell for you with steady income on their sales! Complete money-making outfit, including sales books in colors, samples cut from actual hose, instructions, order blanks, etc. furnished free and prepaid. Rush name and address on postcard and start making money next week. Kendex Co., Babylon 186, N. Y.

SCHOOL Seniors—Earn 40% commission selling classmates America's most beautiful Graduation Name Cards. Largest Selection. Outsells all others. Free Sample Kit. Printcraft, Dept. P, 1425 E. Elm St., Scranton 5, Pa.

SELL new, used clothing from home, auto, store. Wholesale catalog Free. Calumet Sales, 4719 Kennedy Ave., East Chicago, Indiana.

GUARANTEED product in protected territory, if you are now selling or intend to sell house-to-house. For full 1 Qt. Sample amazing High Shine Windsor No Rubbing Wax, send only 25c covering handling and postage. (Sells for \$1.25). Windsor Wax Co., Inc., Dept. P.S.-2, Hoboken, N. J.

FREE water and our concentrates make flavors, lotions, shampoos, 72 products. Labels, bottles furnished. Qualco, F-20030 Russell, Detroit.

MAKE one thousand dollars or better monthly selling Safety Clamps. Will stop shimmy. Positive lock or tie rods that have caused thousands of deaths. Positively a must for intelligent motorists. No consumer resistance. Agents make \$3.00 per dozen. Distributors wanted. Cheapest insurance against death in existence. Free literature. Lox-It Manufacturing Co., Clarksdale, Miss. Sample 95 cents.

STRANGE "Dry" Window Cleaner. Sells like wild. Replaces messy rags, liquids. Simply glide over glass. Samples sent on trial. Kristee 127, Akron, Ohio.

BIG Bargains for big profits. Over 100 sensational wholesale values. Men's used suits \$2.00, pants 35c, topcoats \$1.25, overcoats \$2.00, shoes 20c. Experience unnecessary. Free catalog. Superior, 1250-B Jefferson, Chicago 7.

AGGRESSIVE agents wanted to demonstrate guaranteed Copper-Cote Ironing Pad and Cover sets. Endorsed by housewives everywhere. Sure-fire sales plan helps you get started. Generous commissions. Protected territories for producers. Real deal for live wires. The Sheldon Company, Box 1347, Milwaukee, Wisconsin.

GOLD lacquered Window Sign Letters. Large Sizes Penny Each. New Foils. Absolutely Beautiful. Free Samples. Atlas, 544 W. 79th, Chicago 20.

POCKET Pal: Replaces Pocket Knives. New, Safe, Beautiful. Always razor sharp. 50c seller. 321% profit. \$15.00 or more daily. Agents, Salesmen, Distributors. Sample 10c. Nelson Mfg. Co., 222 W. Kellogg, St. Paul 2, Minn.

IF you work in a factory or shop, you are passing up the opportunity of a lifetime to build a steady Extra Income by selling subscriptions to Popular Science Monthly to your fellow employees. For free kit and complete instructions write on a postcard to—Manager of Agents, Dept. A148, Popular Science Publishing Co., Inc., 353 4th Ave., New York 10, N. Y.

LOOK here! Wanted—Men to start in business on our capital. Sell some 200 farm-home Products. Thousands our Dealers now make quick sales, big profits. For particulars write Rawleigh's, Dept. K-192-PSC, Freeport, Ill.

NEVER before new mechanical way to wash your car professionally. Easy to use. Save time! Money! Guaranteed. Write for details. Sample \$4.95 prepaid. Melaire Distributing Co., 420 Lexington Ave., N. Y. 17.

REPRESENTATIVES. Fast Moving Household Product, 1 Pound sample and information. 50c. Brennan's Product Company, 10015 Grevillea, Inglewood, Calif.

BIG Money—Fast. Sell Quality Plastic Tablecloth (from \$4 doz.), Aprons, Curtains, etc. Factory Prices! Free Samples! Durever, 314F Albany Ave., Bklyn 13, N. Y.

MAKE 100% profit selling name imprinted Christmas cards and \$1.00 assortments. Also personalized napkins and stationery. Request samples. Dunbar, Sanford 2, Florida.

MAKE big weekly commissions selling nationally advertised aluminumware, silverware, pressure cookers, canners and gift items. No investment required. Simply take orders, collect commissions, we do the rest. Complete sales kit free. Write Ury Co., Dept. 39C, 222 4th Ave., New York 3.

\$5.00 CASH advance commission every sale 38-piece "Lady Ann" silverware. Guaranteed quality, value bring sales galore. Also varied line of other silverware and housewares. Write for sure-fire Sales Outfit. Dexter Silver Co., Dept. PS-11, 303 Fifth Ave., New York 16.

\$1 STARTS you in business. Sell lined ties, 100% wool interlining. Costs you only \$7 per dozen, you make \$5.00 dozen. Send \$1.00 for special introductory offer two ties. Catalog complete line Free. Philip's Neckwear, 20 West 22nd St., Dept. P28, New York 10.

SELL ultra-blue stock signs to stores. 1000 slogans, comedy, general, religious. "7x11" cost 6c—Sells 35c—Make money. 15 samples Ultra-blue signs "7x11"—\$1.00 postpaid. L. Lowy, 8 West Broadway, Dept. 430, New York City 7.

EARN Big Money Year 'round. Be a one-person-department-store. Take orders for shirts, ties, hosiery, lingerie, Household linens, etc. For information Corporate Merchandisers, Dept. PS-8, 110 West 34th Street, N.Y.C. 1.

AGENTS Wanted for our Slot Machines and coin operated amusement games in every town and community. Sell to clubs and homes, or start a route. Webb Distributing Co., Dept. P40, 6 So. Kedzie Ave., Chicago 12, Ill.

SCHOOL Seniors!!! Your postal will bring our wonder, Kwick-Sell Cardalog of popular Graduation Name Cards. Biggest profits!!! Only firm giving free souvenir chest and Card Case. Don't miss out! Hurry that postal!!! Craftcards, Box 235 (M), Pittsburgh 30, Pennsylvania.

GREETING Cards. Gift Wrappings. Personalized Napkins. Book Matches. Playing Cards. Raum, 4154-B Fifth Street, Philadelphia 40.

INFORMATION — Wholesale supply sources. Moneymaking plans. Increase your income. Write Reynard Station, Smithfield 3, Ohio.

70c PROFIT On Every Dollar with new sales plan. Circular tells how. Alliance Chemical, Alliance, Nebr.

SPECTACULAR Guarantees, popular prices, make selling easy. Biggest steady repeat profits selling Colt's famous men's, Women's Guaranteed shoes, hosiery. Experience unnecessary. Free selling outfit. Colt Shoes, 601-K11 Atlantic, Boston 10, Mass.

MAKE 50% on \$15 Business Service Folder "S"—\$1. Dasco, Moosup, Conn.

PLASTICS. Knives, Coasters. Other Advertising Specialties. \$108.00 actually earned in day. Kit \$1.00 Refundable. E. Howlet, Huntington, N. Y.

SILVER Plating Liquid (NuSilver). Apply with cloth. Durable, guaranteed, genuine, silver finish. Renew silverplated ware, articles, pieces. Silverplates brass, copper. NuProcess Products, Aurora, Ill.

SCHOOL Seniors—Earn 40% commission selling classmates America's Most Beautiful Graduation Name Cards. Largest selection. Outsells all others. Free sample kit. Printcraft, Dept. M, 1425 E. Elm Street, Scranton 5, Pa.

MAKE Sensational Profits! New, sell-on-sight Plastic Line: Tablecloths, Aprons; many other splendid fast-selling items, novelties. Postal brings free details, special deals. Hurry! Royalty, Box L-748, Passaic, N. J.

BUY thousands of nationally advertised products direct from manufacturers. Write for "Buy Direct and Save." Consumers Ass'n., 287-B Lebanon Ave., Mt. Lebanon, Pa.

MAKE 60%-100% profit as sales representative for all-metal interlocking weather strip sets. Prospects everywhere. Experience unnecessary. Write E-Z-ON-29, Box 1061, Federal Bldg., Chicago 90.

POSITIVELY New. 100% Profit. Heavy repeat sales. Fast selling, two sided, reversible neckties. Free details. Farrell Company, Dept. 20, 1377 Galbraith, Cincinnati 31, Ohio.

SELL!! Balloons, Combs, Specialty Merchandise. Carleton House Distributors, Texas City, Texas.

WOULD you pay 3%—first \$350 made? Color-illustrated book "505 Odd Successful Enterprises" free! Proven! Work at home, office. Expect something odd! Pacific, Oceanside, California.

YOUR Own Business, \$100 Weekly. Fast selling plastic furniture covers. Floral table covers, aprons, etc. 100% profit. Free Sample. Carwell, 330-GG South Wells, Chicago.

SELL famous \$3 "Fire-Killer" extinguisher with bracket, wholesale or direct; exclusive territory. Demonstrating sample \$2; refilled free. "Fire-Killer," Syracuse 1, New York.

QUALITY Merchandise at new low prices. Plastic tablecloths, aprons, garment bags, utility covers. Free illustrated Price list C811. Acclaim Products, 25 Hillside Ave., New York 34, N. Y.

BIG Profits! Sell Deluxe Three Piece Set, Ball Pen, Hooded Pen, Mechanical Pencil, Gold Plated Caps. Sample \$1.50. Write Sampa, 1120 Brighton Beach Ave., Brooklyn 24, New York.

63 HIGHGRADE SALESMEN

START your own business on our capital. Always your own boss. Hundreds average \$6,000 to \$25,000 annual Sales year after year. We supply stocks, equipment on credit. 200 home necessities. Selling experience unnecessary to start. Wonderful opportunity to own pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. KU-PSC, Freeport, Ill.

MAKE \$15.00 to \$25.00 per day. Joe Louis' and Marva Louis' (his wife) toilet articles, cosmetics and other products for men and women are sensational. White people like them; colored people buy on sight. Perfumes, powders, pomades, creams, brown creams, flavors, remedies, and many other fast sellers are our features. \$3.95 buys \$10.03 (23 items) retail deal—send \$1.00, pay postman balance. Be first in your community to offer this new line and you will be happy. Joe Louis Products Company, 6 E. Garfield Blvd., Dept. PS-11, Chicago 15, Illinois.

DROP Shipments. Bar-B-Cue picnic sets. Mowers, Engines, Motors. Farmco, M2011, Excelsior Springs, Mo.

MAKE \$2,000 next 60 days. New invention cleans clogged drains in jiffy. No chemicals. Nothing like it! Prospects everywhere. Commissions advanced. We deliver. Free Sample Offer. Campbell Co., Rochell 4, Illinois.

POPULAR SCIENCE OPPORTUNITIES

MEN And Women—Earn \$25 daily. selling silverware, aluminumware, pressure cookers and 14 more fast selling items direct to consumer. Full or part time. No investment. Write for free sales kit. Colonial Products, Dept. C11, 30 Ormsbee Ave., Providence, R. I.

MAKE \$500.00 A Week!! Be first with "Neo-Fluorescent" Revolutionary Invention! New Type Fluorescent Sign Replacing Neon. Fantastic Virgin Market with Dealers. Mfgs. Distrib. nets Fabulous Profits. Free Sample offer. Rose Co., 539-XX So. Franklin, Chicago.

STOP! Read Carefully! Today's rapid-fire money maker. Only complete giant volume World War II. Profits to distributors already over \$2,000,000. Surface only scratched. Sells on sight. Over 20,000,000 prospects—every home, shop, school, office. Don't miss these Landslide profits. Write quick! Universal House, 1006-B Arch Street, Philadelphia, Pa.

SALESMEN—Put yourself in line for big money and real future. Keep stores supplied with 5c—10c counter goods. Nationally advertised merchandise. Top profits for you and merchants. Liberal deals boost sales. Side-line or full time. World's Products, Dept. 83-K, Spencer, Ind.

67 EDUCATIONAL AND INSTRUCTION

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or Spare time. Details Free. No obligation. Ellis, Box 203, Cedar Grove, North Carolina.

NURSES' Training School. Make up to \$30-\$40 week as a trained practical nurse! Learn quickly at home. Booklet free. Chicago School of Nursing, Dept. M-11, Chicago.

PLASTIC Kits. Ideal Training. For hobbyists. Complete instructions, templates and Lucite to make ten beautiful useful gifts, picture frames, candle holders, dishes, etc. All for \$2.00 prepaid. Plastikits, Lawrence, Michigan.

INDUSTRY needs Chemical Technicians. Learn at home from graduate chemists. Laboratory included. Write for free details. Institute of Applied Technology, 309 Harvard St., S.E., Minneapolis 14, Minnesota.

LAW students! Finish your law correspondence course with our expert coaching. Low cost. Write today, stating your course and how far advanced for free particulars. Glenn Squires, P. O. Box 5375, Van Buren Station, Chicago 7, Ill.

FOR an extremely profitable lifetime business operate a Collection Agency-Credit Bureau. Easily learned. Free folder. Cole & Associates, Syracuse 2, N. Y.

LEARN Piano Tuning. Prepare for Career in fascinating profession. \$5,000 year easily earned. Real security, pleasant easy work. No profession Paying so well can be mastered so quickly. Natural Aptitude, desire to get ahead chief requirements. Prospectus and full information on request. G.I. Approved. Harmony School of Piano Tuning, Box 582, Harrisburg, Pa.

BECOME a Doctor of Psychology or Metaphysics. Teach secret of contentment, happiness. Win degree of PsD. or MsD. Solve mental worries. Free book. College of Universal Truth, 5153-K N. Clark, Chicago.

HAVE your own office! Many earn up to \$5,000-\$15,000 annually in the collection business. Learn by home study course. Experience unnecessary. Write for Free Bulletin. No obligation. Franklin Credit School, Dept. 223, Roanoke 7, Virginia.

BE a Notary Public. Largest notary supply house equips you for \$16.97, guarantees your appointment by governor. Honor, prestige. You certify legal papers, collect fees. Easy. At home, office, anywhere. You use official seal made with your name. Notaries needed everywhere. Be one. Write Stationers Exchange, Helotes 20, Texas.

INVESTIGATOR and Detective Training. Scientific Crime Detection Courses. Free Literature. Write Today! State age. Institute of Scientific Criminology, Dept. H, 1324 West Broadway, Spokane, Wash.

WANTED. International and other used correspondence courses. Bought. Sold. Rented. Literature free. Baker, 5509-A Winthrop, Chicago 40.

MACHINEGUN adding! 6th grader or college graduate. Double your speed in 30 days without effort. It's fun. Amazing details free. Vandergrift, 517A Lincoln Place, Orange, New Jersey.

MONTH'S free study without deposit. Receive \$2.50 "Cosmic Radiance" book. Finding inspiration, telepathy, enlightenment, ecstasy, healing power; remit; otherwise return book. Crane, Publisher, Kingsport 1, Tenn.

LEARN Auctioneering By Mail. Sample lesson free. Nelson Auction School, Renville 5, Minnesota.

LEARN Math at home. Individualized Instruction. Details Free. New Correspondence School, Box 27, St. Johns Station, Brooklyn 13, N. Y.

BE a real estate broker through home study or classroom instruction. Write for free book. Approved for veterans. Weaver School of Real Estate, 15 E. Pershing Rd., Box CP-2, Kansas City 8, Mo.

MEDICAL Laboratory Technicians in great demand. We train you in your own home, in your spare time. Also home study course in General Chemistry. Catalogue free. Imperial Technical Institute, Box 973-S, Austin, Texas.

LEARN Real Estate Brokerage. Free Literature. H. Ingber, Great Neck, N. Y.

MATHEMATICS. Arithmetic; Algebra, Geometry, Trigonometry, Calculus, Physics, Radio and Business Math, Drafting, Architectural, Mechanical, Electrical, Structural, Building Estimating. Approved for Veterans. Mondell, 230 West 41st, N. Y.

PIANO Tuning Pays. Learn this profitable profession at home. Our Tonometer and mechanical aids make learning easy. No knowledge music necessary. Diploma granted. Largest and oldest school—50th year. G. I. Approved. Write for booklet. Niles Bryant School, 77 Bryant Bldg., Washington 16, D. C.

DEVELOP photographic mind by Super-memory. Write Thor Books, CS-11, Box 1210, Chicago.

TYPEWRITER Repair manual. Complete instructions plus 100 drawings covering Smith, Royal, Underwood, Remington and Woodstock. Free Consultation Service. Write W. F. Brown, Dept. 16, 1377 No. Wilton Pl., Hollywood 28, Calif.

STUDY Dental Technician Trade at home. Ten Complete Lessons \$5.00. Grant Laboratory R. Los Angeles 14, Calif.

NAMES and Faces Remembered. Quickly, Easily, \$1.00. Box 478, No. Hollywood 2, California.

69 CONTESTS

WIN Cash, Cars in Prize Contests! Write for copy filled with current contests, winning hints and tips. Send only 25c. Wright Contest Digest, Dept. 20-M, P. O. Box 2266, St. Louis 9, Missouri.

\$1,000,000 FREE—Contests—Yearly. Win fortune. Winners prepare your entries—lowest cost. Research, 13 Earl Street, Red Bank, N. J.

70 LANGUAGE OUTFITS

LINGUAPHONE Makes Languages Easy at home. Learn to speak Spanish, Portuguese, Italian, French, German, Russian, by quick, easy Linguaphone conversational method. Save time, work, money. Linguaphone Correspondence Courses are available to veterans under G.I. Bill of Rights. Send for free book. State if G.I. Linguaphone Institute, 54 RCA Bldg., New York 20, N. Y.

72 AUTHORS SERVICE

I WANT New Writers to cash hundreds of checks for \$1 to \$100, offered each month. The easiest way to write for pay. No previous experience necessary. Send for Free details. No obligation. Saunders M. Cummings, 467-S Independence Bldg., Colorado Springs, Colo.

73 BUSINESS SERVICE

CHICAGO Mail Address. Receiving and Forwarding. Confidential Service. \$1 monthly. Faultless, 3439-S Michigan, Chicago 16.

74 CARTOONING, SIGN PAINTING, DRAWING AIDS

"HOW to make money with simple cartoons". A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 1911, Pleasant Hill, Ohio.

SIGN painting taught at home by an old master. Ben Kerns, Box 812, Greenville, S. C.

9 ALPHABET 3 Numeral Pattern Sets and Catalog \$1.00. Sign Letter Distributors, P. O. Box 101, Mineola, N. Y.

LEARN Cartooning, Illustrating, Show-card Writing, Photo Coloring, etc., quickly with our new, easy methods. Catalog Free. National Artists Bureau, Box 4248 E, Dallas 8, Texas.

EARN Money Evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle (2-B), Wisconsin.

75 CHALK TALK-STUNTS

CHALK Talks, Laugh Producing Program, \$1.00. Illustrated Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

76 TYPEWRITERS

AUTHORS! Mail me your manuscripts, letters, with \$1.00 for each thousand words, and carbon copy, prompt remailing to you. Carrol Adair Dickson, RFD No. 10, Box No. 726A, Dallas, Texas.

RECONDITIONED Typewriters, Printing Devices, Office Appliances, Supplies. Dixiegraph, King, N. C.

78 RUBBER STAMPS

3 LINES 45c; cushioned, indexed, 55c. Pads 35c. Printright, Wauwatosa, Wis.

RUBBER Stamps, 3 lines 45c; cushioned, indexed, 50c. Pads 35c. Printright, Wauwatosa, Wis.

QUALITY Stamps! 3 Lines, 50c, 250 Letterheads—Envelopes, \$1.50. Catalogue. Johnson Press, Box 6-B, New York City 26.

79 PRINTING OUTFITS, SUPPLIES

"PRINTOMATIC" Self-feeding Post Card Stencil Printing Duplicators \$9.50 Up. Office Size Duplicators, Speedprints, Hilcos, Excellographs \$33.41 Up. Literature Free. Pittsburgh Typewriter Supply, 336 WE Fourth Ave., Pittsburgh 22, Pa.

PRINTING outfits, type. Send dime for illustrated supply book. Kelsey H-8, Meriden, Connecticut.

PRINTING Presses, Type Supplies, Lists 3c. Turnbaugh Service, Loysville, Penna.

INEXPENSIVE home-made printing press. Details free. Novelty Shop, Downs-ville, Louisiana.

80 PRINTING, MULTIGRAPHING, ETC.

DISTINCTIVE Printing — Stationery. Checks, Cards, Reasonable, Samples, Prices Free. Stumpprint, South Whitley 2, Ind.

CASH In Selling Personalized Stationery. Cards, Napkins, Particulars free. Stumpco., South Whitley 2, Indiana.

1000 BUSINESS Cards \$2.50 prepaid. Samples free. Reliable Print Shop, 905 East Jefferson, Louisville 6, Ky.

HAMMERMILL Bond Letterheads, 8½ x 11, plus #6¾ Envelopes, 100 printed \$1.90. Send 10c for pricelist (refunded first order). Multigraphing, Mimeographing, Photo Offset, Direct Mail Campaigns, Mimic Reproductions, 383-P No. Corona, Valley Stream, N. Y.

150 SHEETS, 75 Envelopes Printed \$1.75 Prepaid. Miller Stamp, Highland Avenue, Malden 11, Massachusetts.

DISTINCTIVE Printing that's different. Reasonable, Samples, Highspire Press, High Spire 1, Penna.

SEND 10c Now, for our 48 page price- list—Refunded first order. McCall Press (PSM), 1326 South 27th, Omaha 5, Nebr.

ENVELOPES Printed 1,000—6¾—\$3.85, #10—\$5.25. F.O.B. Cusack Press, Fulton, New York.

BUSINESS, Personal Stationery. State requirements. Samples. Mero Products, 99 Morrison, Punxsutawney, Penna.

POPULAR SCIENCE OPPORTUNITIES

24 HOUR printing service. Samples Free. Mango. 555-S South 20th. Newark 3. N. J.

82 PATENT ATTORNEYS

INVENTORS. For "Record of Invention" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building, New York 7.

PATENT practice before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Aliwine & Rommel, Registered Patent Attorneys, Suite 413, 815 15th St. N.W., Washington 5. D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John N. Randolph, Registered Patent Attorney, 207 Columbia Bldg., Washington 1. D. C.

INVENTOR'S Guide free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7. N. Y.

C. A. Snow & Co.—S-427. Snow Building, Washington 1. D. C. Registered Patent Attorneys. Write for information.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 938 Columbia Bldg., Washington 1. D. C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 82B-K District National Building, Washington, D. C.

IF An Inventor believes he has an invention, a search of the most pertinent prior U. S. Patents should be made and a report obtained relative to its patentability. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorow, Berman & Davidson, Registered Patent Attorneys, 143-K Victor Building, Washington 1. D. C.

PATENT Protection—Unless an inventor is thoroughly familiar with such matters, he is advised to employ a competent registered Patent Attorney as the value of a patent depends largely upon the skillful preparation of the specification and claims. Send for booklet, "Patent Protection for Inventors", outlining preliminary steps to take to obtain patent protection. Victor J. Evans & Co., 341-M Merlin Building, Washington 6. D. C.

PATENTS—Trade marks. Irving L. McCathran, 316 McLachlen Bldg., Washington 1. D. C. Registered Patent Attorney.

GUSTAVE Miller—Patents and Trade Marks—118-B Warner Building, Washington 4. D. C. Registered Patent Attorney, Associate Patent Examiner, U. S. Patent Office, 1922-1929.

83 FOR INVENTORS

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 82A-K District National Building, Washington, D. C.

"INVENTOR'S Guide" free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7. N. Y.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 206 Columbia Bldg., Washington 1. D. C.

INVENTORS: The usual First Step is to have a search of the U.S. Patents conducted, so I can report on Patentability. Write, without obligation, Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 939 Columbia Bldg., Washington (1). D. C.

INVENTORS: If you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 30A, 1926 Eye St. N.W., Washington 6. D. C.

"Get an Analysis of your Invention by graduate Engineers, Drawings, Models, Write for Details, Dayton Inventors Laboratory, 1941 Riverside Drive, Dayton 5. Ohio."

INVENTORS! Have you good, patentable ideas? Write patent Agency Metzler, 11 West 42nd, New York.

IF An Inventor believes he has an invention, a search of the most pertinent prior U. S. Patents should be made and a report obtained relative to its patentability. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorow, Berman & Davidson, Registered Patent Attorneys, 143-H Victor Building, Washington 1. D. C.

INVENTORS—This firm is registered to practice before the U. S. Patent Office and is available to assist inventors in the preparation and prosecution of their cases. "Patent Protection for Inventors" booklet containing detailed information and steps to take toward patent protection will be sent upon request. No obligation. Victor J. Evans & Co., 342-M Merlin Building, Washington 6. D. C.

IDEAS are worth money. Free booklet. Elo Development Company, L. I. City 1.

PATENT Searches \$6.00; trade-mark searches \$5.00; progress reports on pending applications for patent \$5.00. Invention protection forms free. Write Miss Ann Hastings, Patent Searcher, P. O. Box 176, Washington 4. D. C.

INVENTORS—Save up to \$250 or more! Make your search at home and obtain your own patent without assistance. Details free. Write International Patent Library, 318 Evans Building, Washington 5. D. C.

CASH For your idea. 280 manufacturers need inventions, patented or unpatented. List free. Invention Bureau, 208-S Clinton, Oak Park, Illinois.

CAPITALIZE on your Patented invention quickly. Natco, 2507-N. 29th St., Philadelphia, Penna.

84 INVENTIONS WANTED

INVENTIONS Promoted. Patented or unpatented. Write Adam Fisher Company, 183-A Enright, St. Louis, Mo.

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information, free. Institute of American Inventors, Dept. 30C, 1926 Eye St., N.W., Washington 6. D. C.

HIGHEST Royalties — Cash. Official U.S.I.R.C. certification. Request free Booklet "C". Universal Marketing Co., 354 South Spring St., Los Angeles 13. Calif.

SMALL Inventions wanted by manufacturers. I'll help you sell your invention. Write for circular, S. Hull, 7829 Euclid, Cleveland, Ohio.

CASH For your idea. 280 manufacturers need inventions, patented or unpatented. List free. Invention Bureau, 208-S Clinton, Oak Park, Illinois.

85 PATENTS

INVENTORS: Test the commercial value of your patented or unpatented inventions, quickly and inexpensively. Write for free information. Institute of American Inventors, Dept. 30-B, 1926 Eye St., N. W., Washington 6. D. C.

88 MANUFACTURING

DO you have a product (or an idea) that you wish to have manufactured and sold for you? Racine Manufacturing Company, Racine, Wisconsin.

89 MODELS, MODEL SUPPLIES

MODEL Ship Builders! Are you looking for authentic, precision ship models? Send for richly illustrated fully descriptive catalogue in full color of famous ships of all kinds. Only 25c. Halesite Yacht Service Inc., Dept. C-47, Halesite, Long Island, N. Y.

MOST complete Illustrated Catalog— "O-HO OO" Model Railroad Parts ever published. Send 5c for mailing. Selley, 1377 Gates Ave., Dept. 836, Brooklyn, N. Y.

SHIP and Yacht model fittings; blueprints, Send 25c for illustrated catalog No. 21—Listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Mich.

BUILD Historic Ship Models. Complete Kits 39c to \$8.50; Send 10c for catalog. Ideal Models, 21 West 18th Street, New York 11. N. Y.

SHIP Models—Most complete line in New England of kits, parts, plans and books. Steam and electric power plants for working models. Big catalogue 25c. Dept. S. James Bliss & Co., Inc., 220 State St., Boston, Mass.

SHIP Model and yacht supplies, complete large 64 page catalogue, 30c. Wm. Wild, 510 E. 11th St., New York City.

STEAM Pump-Duplex Type, Castings and dwgs. Literature free. W. S. Van Brocklin, 1036 South St., Roslindale 31. Mass.

POWER Models—steam and gasoline engines, steam traction engine, metals, tools. Catalog 35c. Charles Cole, Ventura, Calif.

DOWMETAL Magnesium for all model makers. Rod, Bar, Sheet and Scale Structural Shapes, Craftsmith, 15427 Robson, Detroit 27, Michigan.

RAILROADERS. 50c gets new 1949 Catalog. Reference Manual. State O or HO gauge. Walther, 269 Erie, Milwaukee 2. Wisconsin.

STEAM engines, boilers, castings. Catalog 25c. Anton Bohaboy, 2297 Price, Rahway, New Jersey.

BUILD Your own model homes, garages, doll houses, displays, etc. Strong wood panels milled to faithfully reproduce shingles, lapsiding and brick in three scale sizes. Write postcard for free picture folder. Scale-Built Materials, Inc., 4622 Ravenswood Ave., Chicago 40, Ill.

90 MOLDS AND MOLDING MATERIALS

MOLD Makers! X.L. Rubber is back. Pints \$2.00. Quarts \$3.50. Gallons \$8.95. Models. Free catalogue. Plastic Arts, Dept. 10, Route 2, Muncie, Indiana.

91 HOME CRAFTSMEN

BEAUTIFUL Texas Ebony. Large piece, \$1. Sample, dime. Particulars, stamp. Many other hardwoods. Starcraft (2), Edinburg, Texas.

KLONDIKE! For Jewelry Makers! Novelty Jewelry findings swept from manufacturers' tables. Parts for bracelets, pins, earrings, finished and unfinished chains, rings, stones, clips, beads, many others. Sample pound assortment \$2.00. 5 pound lots \$7.50. Also, Unset Stones, for rings, jewelry; all colors, sizes, designs. 1,000 assortment \$5.00. sample 100 assortment \$1.50. Also, Beads, assorted colors, sizes. 5 pound lots \$4.00. sample pound \$1.00. Prepaid only. Merchandise Distribution, 19 East 16th Street, New York 3.

CATALOG: Patterns plywood novelty furniture, lawn ornaments, letters, numerals, plaques, frames, silhouettes, weather-vanes, toys. Decal transfers. Over 100 other items. 200 articles illustrated. 25c. refunded first order. (No stamps please). Wo-Met Shop, Box 167, Ashburn, Georgia.

LEATHERCRAFT! Complete stocks of leathers, tools, supplies. Immediate shipment. Free catalog. Kit Kraft, Dept. 3203 W. Washington Blvd., Los Angeles 16, Cal.

POPULAR SCIENCE OPPORTUNITIES

LEATHER designs. Handbags. Billfolds. Belts. Miscellaneous Designs. \$1.00 each. Any three, \$2.50. Lampkin Artcrafts, Box 641-SN, Culver City, California.

PROFITS From Small Bits of Wood. Dollhouse Novelties, Saugus 4, Mass.

LAWN chairs, garden figures, furniture, novelties, toys, etc., 68 popular plans with full size patterns, \$1.00. Mastercraft 11S, 7041 Olcott, Chicago 31, Illinois.

WOOD Crafters. All Rare and Beautiful Colored Figure Veneers, in New, Different, Easy to use form. Booklet, sample 10c. Modecraft, 4423 S. Richmond, Chicago, Ill.

PLYWOOD cabinet kitchen plans, 25c. Playnecabinets, 4617 Johnson Avenue, Western Springs, Illinois.

LEATHERCRAFT Supplies—Begin making beautiful Christmas gifts now. Send \$1.30 for complete Instruction book. Continental Leather Co., 201½ West Magnolia, Fort Worth, Texas.

COPPER and Brass Materials. Complete line for Craftsmen and Workshops. Catalog Free. Groundmaster Company, Boulder, Colorado.

SPECIAL Offer: 80 full size toy, novelty, and lawn ornament patterns only \$1.00 Postpaid. Lynds, Box 193E, Medway, Mass.

BANDSAWS, jigsaws, earn amazing profits. Nu-Art, 34 Rosemont, Weymouth 91, Massachusetts.

"SWISS Music Units, X-mas. Popular tunes \$3.50. Double tunes \$4.50. Irving Meyers, 126 Lexington Ave., New York 16, New York."

LEATHERCRAFTERS! Belt kits, Projects, Leather, supplies. Free catalog. Arts Leather, 411 Joseph Ave., Rochester 5, N. Y.

MAKE Shell Jewelry profit pleasure. Shellcraft book free. 450 Caribbean shells including findings for making six dollars with \$1.00. Shell Company, Chamber Commerce Bldg., Miami 36, Florida.

CASTINGS, make your own, bronze, aluminum, etc. Price list supplies, and equipment free. Lehnert Company, Norwood 3, N. J.

93 BUILD IT YOURSELF

ZEOLITE home water softener. Plans for building your own \$1. Materials available from us. Lake Region Mfg. Co., Inc., 3920 K Lynn Ave., Minneapolis 16, Minn.

BUILD at home. Inexpensive, practical Concrete block machine. Motor or hand. Write, Clyde Lee, Mountain View 1, Okla.

IF An Inventor believes he has an invention, a search of the most pertinent prior U. S. Patents should be made and a report obtained relative to its patentability. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorow, Berman & Davidson, Registered Patent Attorneys, 143-G Victor Building, Washington 1, D. C.

BAND Saw—Real project complete blueprints \$3.00. Actual snapshots, specifications 25c. Built Right Blue Print Co., Box 65, Baltimore 11, Md.

STREAMLINED, Built-in kitchen cabinets to fit any kitchen. Complete, easy to understand detailed plans and specifications showing "professional" construction methods. All for \$1.00. Thombert Co., Box 447A, Newton, Iowa.

ESTIMATE cost of building new home. Simple instructions, \$1.00. H. C. Lightfoot, Civil Engineer, Richboro, Penna.

"CONCRETE Block Homes." 32 page booklet: drawings, instructions on how to build. \$1.00. H. C. Lightfoot, Civil Engineer, Richboro, Penna.

MAKE your own handy lightweight Concrete Blocks quickly with new Blockmaker. Circular stamp. Manual 25c. Peerless, New Lenox 1, Illinois.

94 WATCH REPAIRING

WATCHMAKERS' Journal contains valuable information for watchmakers. Latest issue 15c copy. Dean Co., 116 Nassau St., New York 7, N. Y.

95 OLD GOLD, WATCHES, ETC.

HIGHEST Cash for old, broken jewelry. Mail Gold Teeth, Watches, Rings, Silverware, Diamonds, Spectacles. Satisfaction Guaranteed. Free Information. Rose Smelting Co., 29-Y East Madison, Chicago.

HIGHEST Prices Paid for Old Gold, Silver, Platinum, Diamonds, Watches, Gold Teeth, Old Jewelry. Send now. Cash immediately. Goods returned if offer is not satisfactory. United Smelting Works, (The Old Reliable), 39-A South State, Chicago 3.

GOLD \$35.00 Ounce—Mail old gold teeth, jewelry, watches, diamonds—receive cash by return mail. Satisfaction guaranteed. Free information. Dr. Weisberg's Gold Refining Company, 1500-B Hennepin, Minneapolis, Minn.

SHIP scrapped gold, coins, jewelry, diamonds, valuables. Utmost cash airmailed. Simon's, 267 Old Arcade, Cleveland, Ohio.

96 JEWELRY

JEWELERS supplies, findings. Latest catalog, 10c. George Sassen, 154 Nassau Street, New York 7.

STUN Your friends with genuine, sparkling, brilliant-white Zircons. Cut, polished, mounted just like diamonds. Amazing diamond-like appearance. Top-quality. Hard for even experts to tell the difference. Beautiful settings 14K gold. Over 100 gorgeous latest-style rings to choose from. Attractive low prices. Send for big Free Catalog. U. S. Zircon Syndicate, 139 N. Clark, Dept. 16, Chicago 2.

CERAMIC Jewelry Supplies. Bar Pins, ear screws, for ceramic and woodworkers, also, glass and sea shell assemblers. Free catalog. Philadelphia Badge Co., 1007 Filbert St., Philadelphia, Pa. Dept. E-1.

RHINESTONES — Moonstones — Pearls — Findings. Free literature. Herber, 1360-B Hicks, New York 67.

SEMI-finished cowboy buckle sets rings, etc., in silver. Will cast 10 or 10,000 items in gold or silver from your model or drawing. Free circular. Southwestern, Box 3506, Station A, El Paso, Texas.

MAKE Your Own Jewelry! All types of findings, plastic and metal; cameos, beads, shellkits, illustr. catalog, 20c. Hobby Art, Dept. 6, POB 276, New York 18, N. Y.

MAKE your own Christmas, Birthday, Anniversary gifts at home. 3 pounds costume jewelry needing repair, \$5.00. Use stones and parts to make beautiful things for yourself. Rush order. Money back guarantee. B. Lowe, Dept. PS, Holland Bldg., St. Louis, Mo.

97 TOBACCO & PIPES

IMPORTED Virgin Briar Pipes. Unvarnished. Unstained. \$7.50 seconds only 98c. Free Catalog trial offer. Sidney Ram, 156 N. Franklin, Chicago 6, Illinois.

SECONDS \$5.00 Pipes, 2 for \$1.00. Pipe Making Kits, 75c. Literature free. Carvapipe, 2829-F Dixie, Hamilton, Ohio.

FOR greater pipe satisfaction tell us your brand of tobacco and get package Green River free. Pete Moberly, Box 792, Owensboro, Kentucky.

CIGARETTES—Popular brands; minimum 5 cartons. Price \$1.50 per carton; postpaid. Send check or money order. King Co., Box 569-E, Dover, Delaware.

GENUINE Imported Briar Pipe, 60 Cleaners, Complete. Prepaid \$1.00. Splendid Value. Ideal Gift. Lincoln, 10-B South 18th, Philadelphia 3.

YOUR name and advertisement on each of the finest hand made cigars. Box 50, \$3.75. Blount Cigars, 2926 Germantown, Phila.

100 MISCELLANEOUS

CHRISTMAS Price List and Feather Cards samples 25c. Mexican Products Co., 126 No. Main, Tulsa 3, Okla.

VETERANS a Critical Shortage of Railroad Station Agent Telegraphers Exists. Earn \$3,300 year. Advancements to \$6,000 per year. Vacations with pay. Retirement Fund. All qualified graduates placed. Act at once. Write Gale Institute, 2933 Hennepin Ave., Minneapolis 8, Minn.

BALL-Point Pens Refilled. Send empty pen cartridge and 25c. Refill Service, 6106 Plainfield, Cincinnati 27, Ohio.

MAKE your own signs. Simple method. Circular Free. Blue Label, 7001 Ozark, Chicago.

FOR Big Men Only—Quality shoes sizes 10-16. Widths AA-EEE. Dress, work shoes, loafer, wing tips, moccasins, hitops, sox. Guaranteed. Write for Free Catalog. Kingsize, 694 Brockton, Mass.

FIREWORKS: Don't be disappointed. Get Famous Banner Fireworks with all the newest and startling effects. Giant cannon salutes that rock you like a crash of thunder. Whistling devils with weird unearthly noises. Skyrockets that burst in majestic colorful display. Gasp in amazement as you watch the battle in the clouds. Genuine Chinese firecrackers. Over 500 pieces including sparklers for the little tots. Retail value \$12.25 for only \$4.95. Rush order today. Any quantity. Send money order, bank draft or currency. No c.o.d.'s. Big new catalog free. Banner Fireworks Mfg. Co., Inc., Dept. 114, 446 Capistrano, Toledo 12, Ohio.

LOCKSMITHING, secrets, key fitting, lock repairing, opening, prices, sources. Illustrated book \$1.00. Wexler, 7 W. 36, N.Y.C.

LIVE Baby Alligators Postpaid \$3.50. Magic Gift, 937 Washington, Miami Beach 39, Fla.

BIG Mails 10c; year 50c; Name listed directory 25c. Harvey Teeple, Decatur, Indiana.

AMAZING Profits: \$ \$ \$ \$. Prayer lamp for all Christians. Your prayers answered. Shines in the dark. Colonel William J. Smith, 1211 Chestnut St., Room 603-A, Philadelphia 7, Pa.

VENETIAN Blind tape 25c yard. Cord 5c. All Colors. Moore, Box 461, Kittanning, Penna.

"INTERESTING Mails." 25c will keep your mail box full for three months. Bentz, Jr., Chatawa 22, Mississippi.

LET us solve your mathematics problems. Consultation free. Solutions guaranteed or no fee. Mathematics Associates, Box 852, Lancaster, Penna.

NAME Imprinted Xmas Cards By Mail. 25 Card Assortment Currier and Ives prints only \$1.50. Order Several Boxes. Specify Name. Remittance with order. Charles Hansen, 1569 Carmona Ave., Los Angeles, Calif.

YOU never saw an idea like this. Just by arranging numbers in a certain way, you get the most interesting and useful designs. This idea started way back with the Ancients and was helped along by Benjamin Franklin. We've polished it off in a brief, easy reading style, specially for your enjoyment. Get a copy of "n squared" for \$1 and be amazed. Science Speaks, Box 1233, Grand Central Station, N. Y. C.

ADVERTISE with picture postcards. Send your negatives. \$5.00 per hundred. Black & white glossy. Sippican Shop, Marion, Mass.

"SHOE Shining simplified. 3c postage for circular. Preferred Merchandise, Box 923, New York 17, N. Y.

"EVOLUTION and Blood Test." 25c. Christian Evidence League, Malverne, N. Y.

MEDICAL Laboratory Technicians in great demand. We train you in your own Home, in your spare time. Also home study course in General Chemistry. Catalogue free. Imperial Technical Institute, Box 973-S, Austin, Texas.

POPULAR SCIENCE OPPORTUNITIES

RECEIVE mails, magazines, samples. Your name in numerous mailing lists 10c. Warren Greenwood, 273 Broadway, New York 7.

PANNING Gold—Free instructions. Catalogue mining books—supplies. Old Prospector, B-171, Dutch Flat, Calif.

YOU can publish fiction magazine. Free details. Fezler, Patchogue, N. Y.

TOY O' Month Club. 50c for \$1.00 toy. Particulars, Buddy's Toyland, Atlanta 3, Georgia.

SILVER Plater. Will silver gold, copper, brass, silverware. Send \$1.00. Ad-Beel Laboratory, Box 105, Absecon, N. J.

INFLATION—More coming! Plan your protection now. Send \$1.00 for Bulletin K. C. F. Johnson, 48 Roberts St., Watertown, Conn.

BOOKFINDERS! (Scarce, out-of-print, unusual books) Quickly supplied. Send wants, Clifton, Box 1377-PSM, Beverly Hills Calif.

PSYCHONIC Science. Latest in Mind Power. Introductory lesson 25c (coin). Opportunity for Instructors. Psychonic Science, 927 So. Alvarado St., Los Angeles 6, California.

COLLECTOR'S Investment. Genuine diamonds uncut, 1 carat guaranteed, \$15. Kiewit, 1115 Queen City, Cincinnati 14, Ohio.

HYPNOTIZE! Control the minds and actions of others! Completely illustrated course \$1.00. Money Back guarantee. Fowler, Box 1284, Boston 4, Mass.

101 FOR SALE—MISCELLANEOUS

CARDED merchandise, novelties, national advertised drug sundries, confections and specialties items. Free List. Hughes' and Storms, P. O. Box 5792, Cleveland, Ohio. Subsidiary Hughes' Enterprises.

ARMY. Navy Surplus, shoes, jackets, pants, shirts, bunk beds, tents, tarps, a million items, send for free catalog. Cleveland Army Stores, 3810 E. 15th, Kansas City, Mo.

FEVER Thermometers: Every home should have one to know when sickness threatens. Mouth or rectal types 79c each. \$1.50 per set. Baby safety \$1.00. U. S. Bureau of Standards Certification. Remit check or M.O. to Corbe & Thor, 707 Woodward, Brooklyn 27, N. Y.

WAR Surplus. Aircraft items. Shop Equipment. Machinery and a million other items. Free Catalog. Atlas Equipment, 229 Southwest Blvd., Kansas City 8, Mo.

102 WANTED MISCELLANEOUS

ANYTHING of value. Armond, 207 North Fifth Street, Springfield, Illinois.

MERCURY—Highest prices. Free Containers. Write Mercury Terminal, Norwood, Mass.

FREE Catalog—Rotary snow plows, scooters, bicycle motor attachments, home freezers, motors, welders, generators, many other items. LeJay Company, Minneapolis, Minnesota.

104 PERSONAL

HOW You can find out! Information discreetly developed. Any matter, person, problem, anywhere. Personal-Business assignments, representations undertaken. Nationwide. Officially licensed, bonded service. Established 1922. Reasonable. Confidential. William Herman, 170 Broadway, New York.

SEND seven ties and \$1.00, receive seven cleaned ties. Mail Me Ties, Box 4411-B, Phila. 40, Pa.

MAKE friends everywhere. Friendship easily developed. Copyrighted literature explains details. Free information. Interested persons write Strone, Box 157-PS, New York 11.

GOLD ahead means big cash dividends to you, worth it's weight in gold. Details sent free. Specialty Service, 13 Princeton St., Rochester 5, New York.

PSORIASIS Sufferers: Has everything failed to bring even temporary relief from scales, lesions and itching? Then write today for Free important information. You needn't invest one cent! Pixacol Company, Dept. S, Box 3583, Cleveland, Ohio.

DISCOVER Your Real Self. Revealing. New Personality Chart 25c. H. Bauer, Sc.M., 1504 Hollywood, Chicago 26, Ill.

TREASURE Finders-Electronic! Write the Goldak Co., 1543 W. Glenoaks, Glendale 1, Calif.

RUPTURED? Positive comfort, no understraps, no steel, no elastic. Write Smith Manufacturing Co., Preston, Ontario.

HAIR Falling? Dandruff? Write Trichologist, 139 Lewis Street, Phillipsburg, N. J.

MEXICAN Law. General Practice Attorney, 1203 Arizona Street, El Paso, Tex.

STOP Smoking. New Scientific Method Breaks Cigarette Habit Quickly. Pleasantly. \$1.00 Brings You Booklet-Formula Details Complete. Psychogenic Science, Dept. A, Box 402, Canton 1, Ohio.

ART. Scenic photos. Sample 35c. 4—\$1.00. Color Slides 50c. 3—\$1.00. Movies—Sample. Brochure 25c. Novelty, 1227 E. Van Buren, Phoenix, Arizona.

K.W.I.K. Hair Trimmer Miracle Discovery Trims Hair While Combing. Ladies and Men. Send \$1.00. Year's Supply Blades. Wayne Information Bureau, 8742 St. Paul Ave., Detroit 14, Mich.

"THE True Church." 15c. Bulletin, Box 87, Cathedral Station, New York 25.

INFORMATION for single people by Human Relations Consultant. University Graduate. Dr. B. Long, Box 375, Los Angeles 53, Calif.

HAIR thin, falling, dandruff? Getting bald? Amazing results! No liquids, greases, gadgets. Write Life System, 325-D N. Western Ave., Los Angeles 4, Calif.

NEW-YORK Postmark. Remailing Letters, 25c. Gem, 473 Fourth Ave., New York.

106 ADVERTISING

ADVERTISING Sensation! Reach 2,100,000 families, \$32.90 inch. Display, classified, ratebook (newspapers, magazines, mailing lists), advertising assistance, free. Chicago Advertising Agency, 20-PS, West Jackson, Chicago 4.

24 WORDS in 50 Weeklies, \$4.96. J. Darnell, 730 Hays, Jackson, Tennessee.

ADVERTISE: 24 Words, 40 Newspapers, \$3.50. Lists Free. Advertising Bureau, 10511-P Springfield, Chicago 43.

108 GENEALOGY

TRACE Your Ancestry with "Guidex"! Literature 10c. Family Guidex, 5 Bulls Head Station, Rochester 11, New York.

110 TAXIDERMY

FINEST Glass Eyes; Taxidermy Supplies. Catalog Free. Elwood Company, Dept. 235, Omaha 2, Nebraska.

113 DRAFTING

SAVE on drafting materials. Free catalog. Draftsmen's Supply Co., 187 W. Madison, Chicago 2.

114 DRAFTING INSTRUMENTS

SURPLUS. Electrical, mechanical devices. List free. Siefke, Box 18, Sta. E. Buffalo 11, N. Y.

115 DRAWING & ART SUPPLIES

BEAUTIFUL Plastic Artist's Palette, 9 x 12, \$3.00. Literature, Star Specialty, Box 2555, Paterson, N. J.

OPTICAL Illusion: Makes drawing simple tracing. Bruce Enterprises, North Hollywood 13, Calif.

SCULPSTONE—Make Gifts. Make Money at home. For Artist, Sculptor, Hobbyist, Designer, etc. Imported Oriental Stone. Beautiful in grain and color! Cuts easily with pocketknife. Endorsed by professionals! Work Kits \$1.60 & \$2.60 P.Pd. Thousands Satisfied! Far Eastern Sculptstone Co., Inc., 159 East 28th St., Dept. S, New York 16.

117 TATTOOING SUPPLIES

TATTOOING Outfits, Supplies. Illustrated List Free. Zeiss, 728 Lesley, Rockford, Illinois.

120 CANDY MAKING

MEN-Women—"Most Everybody Likes Candy". Learn to manufacture in a professional manner at home. (Our 38th year.) Ragsdale Candies, East Orange, N. J.

125 WOODS

CHRISTMAS cards of real wood. Write Cards of Wood, Manlius 2, N. Y.

129 MAGNETS

ALNICO magnets—Seven assorted \$1.00! Ronald Eyrich, Box 849, Milwaukee 1.

TWO Alnico (V) magnets, booklet, literature—25c. Terry Sales Company, 1915-23 Nebraska Avenue, Toledo 1, Ohio.

131 TREASURE FINDERS

METAL Detectors. The Very Latest Circuit. Free Literature. Hedden Metal Detectors, 3329 Liberty St., Pittsburgh 1, Pa.

TREASURE Hunters! New 11-pound feather-weight Model 101 locates gold, silver and minerals. Money-back guaranteed best available. Free information. The Goldak Co., 1544 W. Glenoaks, Glendale 1, Calif.

SEEK Buried treasure; Methods, mysteries, devices explained. Circulars free. Century Press, Box 151-D, Glen Ellyn, Ill.

M-SCOPE Metal Locator fully guaranteed and unsurpassed in efficiency. New featherweight models. Time payment plan. Free literature. Fisher Research Laboratory, Inc., Palo Alto, Calif.

134 CAPITAL

CAPITAL for your new product or idea. Why sacrifice potential profits? You can obtain necessary operating capital the proven Myfax way. Results certain. You retain full control. Instructions \$5.00. Myfax Co., P. O. Box 2106, San Francisco 26, Calif.

137 DETECTIVES

DETECTIVE Training. Phillips Secret Service, 1917C, N. Kenneth, Chicago 39, Ill.

DETECTIVES—Work home—Travel, Experience unnecessary. Write Wagoner P-125 West 86th, N. Y., N. Y.

142 INFORMATION

MONTH'S free study without deposit. Receive \$2.50 "Cosmic Radiance" book. Finding inspiration, telepathy, enlightenment, ecstasy, healing power; remit; otherwise return book. Crane, Publisher, Kingsport 1, Tenn.

143 NAME LISTS

MAILING lists; most classes, 1000 \$5.00. Free Prospectus, Dixie Service, King, N. C.

145 SOUVENIRS

THREE Military Emblems, price list 10c. Hobbyguild, 57-X Sumner Ave., Brooklyn, N. Y.

146 REFRIGERATION

REFRIGERATION Graduates: Booklet helps you earn more money. Send for free details. Refrigeration Advisory Service, 3153 Chippewa St., St. Louis 18, Mo.

AVIATION CABLE

Flexible 133 strand wire cable, 5/32 in. diam., 3300 lb. break test. Lengths up to 450 ft. Use for tow rope, guy wire, clothes line, etc. Wgt. per 100 ft. 4 lbs. Specify length wanted. No. 421—Per Ft. **4c**

ARMY BANDO-LEERS



Of fine heavy khaki. Big roomy pockets with snap button fasteners. Fine for hunters, campers, boy scouts, etc., also for shop work in carrying small parts, etc. Material alone is worth this price. Shp. wt. 1 lb.

11 Pocket Type No. **49c**
5 Pocket Type No. **29c**
129 Each

MESS KITS

Regulation two-piece Army Mess Kits with folding handle. Used, but perfect. Weight 2 lbs. No. **69c**
A116—Ea.



CANTEENS

Reg. U. S. issue canteens. Plastic screw top chained to body. Slightly used but perfect. Wgt. 1 lb. 117—Metal **69c**
118—Plastic—Ea.



CANTEEN CUPS

All metal. Folding handle. Wgt. 1 lb. No. A120—Each. **25c**

CANTEEN COVERS

Heavy canvas. Button fastener. New No. 530—Each. **69c**
Used No. 119—Each. **35c**

WIRE CUTTER

Heavy duty, compound leverage. Cuts up to 1/4 inch wire. Upper jaw acts as feeder to cutting edges. Insulated handles. Ideal for farm fence work and shop use. Shp. wgt. 2 lbs. Stock No. **392—Each \$1.95**



Heavy Duty RUBBER GLOVES BRAND NEW

Extra heavy—extra long. Brand new, high quality gum rubber for softness and ease in use. Designed for heavy duty industrial service—protection in handling chemicals, acids, etc. A real bargain at this low price. Stock No. 295—Per Pair, Only **79c**



ARMY AIR CORPS TYPE

SUN GLASSES

Ideal for driving, sun glare, sports and work. 24 carat gold plate frames with Pyralin sweat bar—adjustable nose bands. Large aviation type lenses. Case included. Shp. wgt. 1 lb. No. 238—Per Pair **\$2.95**



AMMUNITION BOX

Used for 50mm ammunition. Heavy, all metal design with latching top and folding handle. Provides safe, fire-proof storage for valuables, etc. Measures 12x6x7 1/2 inches. Used but in new condition. Shp. Wgt. 8 lbs. No. 338—Each **79c**



Waterproofing Compound

Gov't. surplus! A liquid formula for tents, tarpaulins, canvas clothing, etc. Use on old or new materials. Gallon covers 100 to 120 sq. ft. Stays flexible—will not peel or chip. Shp. wgt. 10 lbs. No. 423—Per Gallon. **\$1.49**



WAR SURPLUS AND HUNDREDS OF OTHER BARGAINS

POPULAR RECORD ASSORTMENT



No. A300—25 Records. All Dance. Wgt. 14 lbs. **\$4.88**

No. A301—25 Records. Hillbilly, Race and Blues. Wgt. 14 lbs. Set. **\$4.88**

No. 302—25 Records. All Hillbilly numbers. Wgt. 14 lbs. Set. **\$4.88**

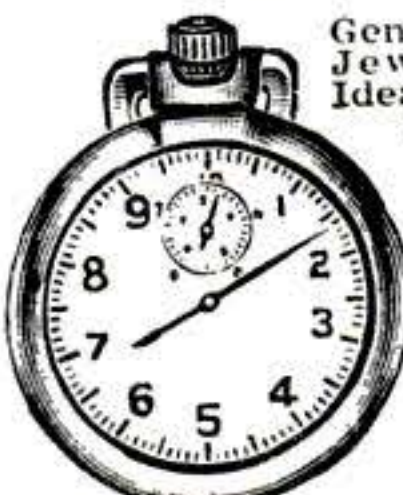
Fifty records of modern dance, race, blues and hillbilly selections. No two alike. Famous name bands and artists included. Used in juke boxes, but guar. perfect. Shipped exp. collect only—no exchanges or refunds. Wgt. 28 lbs. No. A303—50 records **\$9.64**

STIRRUP PUMP

Works with any pail or bucket. Shoots a high pressure stream up to 30 feet. Use it for spraying garden and trees, for whitewashing, fire fighting, drainage, etc. Complete with 10 foot flexible hose. All brand new. Regular \$3.80 value. No. 244—Each. **\$1.49**

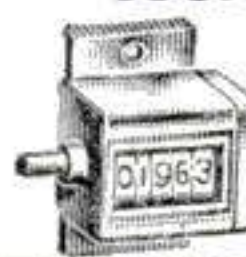


15 JEWEL STOP WATCH U. S. AIR CORPS SURPLUS



Genuine Elgin 15 Jewel movement. Ideal for split second timing in racing, sports, time study, etc. Full sweep split second hand graduated in 1/10th seconds. Stem wind, start, stop and reset. Used but guaranteed perfect. Wgt. 1 lb. No. 200—Each. **\$9.95**

VEEDER ROOT COUNTING MACHINE



Five wheel type—counts to 99,999 and repeat. Nickel finish case. Has 1/8 inch round shank. Use it for any counting job. Brand new. Shp. wgt. 1 lb. No. 241—Each. **98c**

CLINOMETER



SHOWS DEGREE OF INCLINE

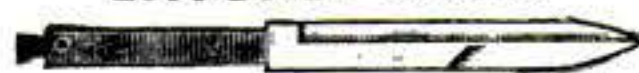
The pendulum acts as a plumb bob. It swings back and forth over a calibrated scale that shows you the degree of incline. Use on ships to show amount of roll—may be used for any purpose where it is desired to determine the degree of incline. Plastic body 12 x 7 inches. Brass pendulum in black finish. Shipping weight 3 lbs. Stock No. **393. Each only. \$3.95**

RUBBER OVERBOARD SUIT



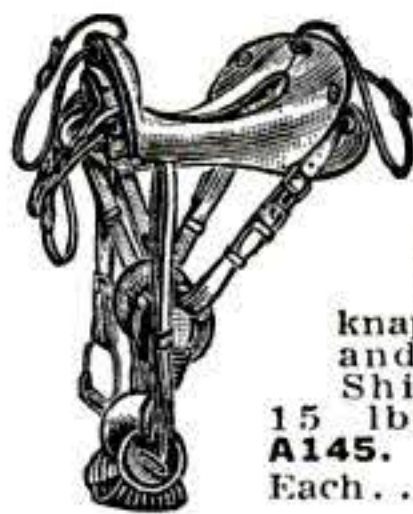
Here is a buy! Fits over your regular clothes and shoes. Can be cut apart for waist high waders, hip high or knee high boots, also arm length rubber gloves. Heavy gum rubber over fabric. Fine for commercial fishermen, sewer diggers, etc. Use it as is or cut it up for waders. All brand new! Wgt. 14 lbs. No. 183, Each. **\$4.95**
Please include 75c for postage.

BAYONET BLADE



Fine forged steel. Ground but not polished. May be made into throwing or hunting knife or spear. Blade 6 3/4 x 7/8 inches, 1 1/4 inches overall. Will take and hold a fine edge. Shp. wt. 1 lb. No. 664-R—Each. **49c**

McCLELLAN SADDLE



Brand new! Top grade cowhide, 12 inch seat. Hair girth. Has straps for blanket roll and knapsack. Gun boot and sabre loops. Shipping weight 15 lbs. Stock No. A145. Each. **\$16.95**

ELECTRIC MOTOR

Small but powerful. Shaded pole type, designed for fan application. 115 V 60 cycle. Has 1/4 inch shaft, one inch long. Operates at 3150 RPM under no load, 2000 RPM under 2.33 oz. inches load. Full load current .6 amp. Ideal for use on toys, window displays, etc. Shp. wgt. 1 1/2 lb. Stock No. 555—Each only. **\$1.95**



7 LB. EXPERIMENTER PARTS ASSORT. KIT



A "gold mine" for the radio serviceman. Hundreds of valuable radio parts, new radar and electronic parts and sub-assemblies, coils, resistors, trimming condensers—worth many times this low price. **\$1.79**
A130R—7 lbs.

RAIN SUITS

New 2 piece rain suits. Of durable wear resisting water and wind repellent OD fabric. Bib style pants, zipper fly. Jacket has parka attached. Guaranteed 100% weatherproof. Small, medium and large sizes. Shp. wgt. 3 lbs. No. R549—Ea. **\$4.95**



Officers Watch Compass



Brand new gov't. surplus. Army-Navy model. Single jewel mounted needle. Silver colored dial. A splendid value. Shp. wgt. 1 lb. A174—Each. **98c**

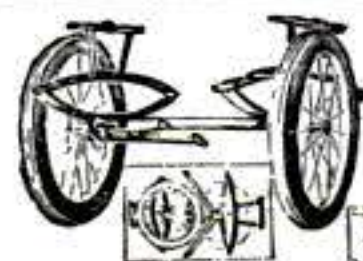
OXYGEN TANK

Loaded with aviator's breathing type oxygen at 1800 pounds pressure. Tank measures 13 1/2 x 5 1/2 inches with rounded ends. Tank is of solid metal fitted with brass release valve at top. Brand new! Loaded—ready for all types of emergency use. Shp. wgt. 13 pounds. Ship exp. only. Stock No. 390—Each, only. **\$3.50**



AVIATOR'S OXYGEN

Bail out type. Consists of all metal tank, release valve, gauge and breather hose, all enclosed in khaki colored cloth bag. These tanks are loaded with oxygen at 1800 pressure. Ideal for use as reserve oxygen supply for all types of emergency use. Shipping weight 4 pounds. All brand new. Stock No. 391—Each. **\$4.95**



TRAILER UNDER-CARRIAGE

OVERSIZE TIRES

Build your own trailer for boat, camping gear or delivery service. Fitted with 26 x 2.125 U.S. Royal Tires. Motorcycle type wheels. Solid steel axle, leaf type springs and body mounting brackets. All brand new! Hitch not included. Folds to fit trunk of car. Shipped express collect only. No. 199, Ea. **\$18.95**



ORDER DIRECT FROM THIS AD

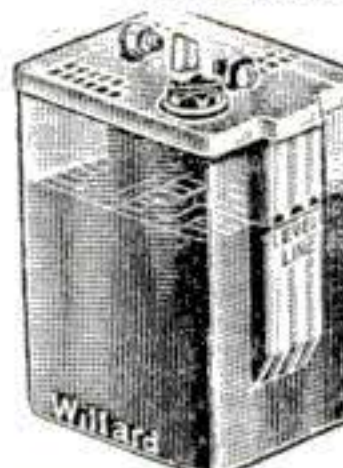
Values galore! Hundreds of hard-to-find items for home, shop and outdoors. Make remittances by money-order, bank draft or personal check. Send 25% deposit on C.O.D. orders. No C.O.D.'s on orders for less than \$5.00. Include sufficient postage on parcel-post orders—any overage will be promptly refunded. All quotations F.O.B. Chicago. Used items and materials are guaranteed serviceable and as described. Your money back if not more than satisfied.

SEND 10c TO COVER POSTAGE AND MAILING ON BIG CATALOG—READY IN ABOUT 30 DAYS

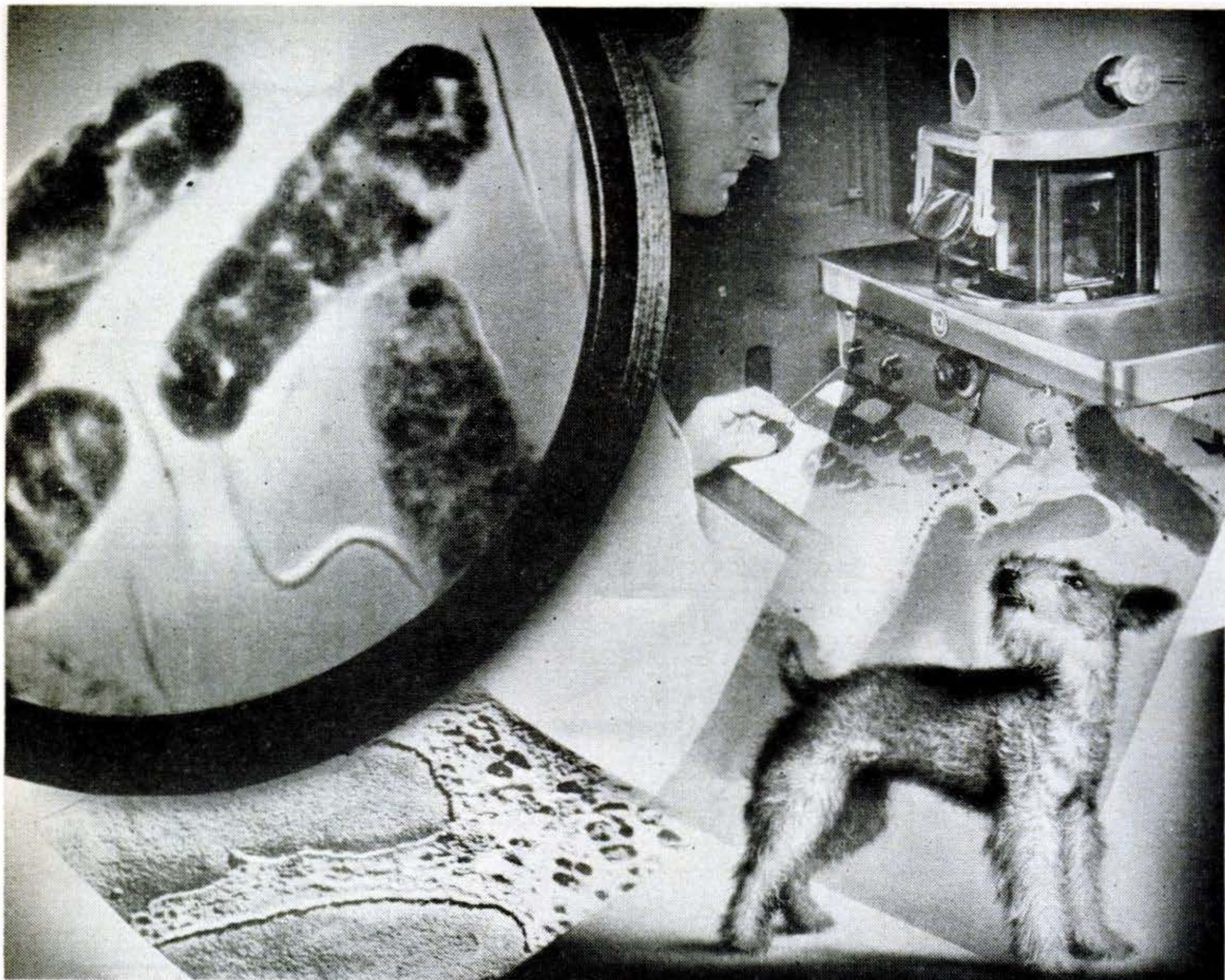
STARK'S

Dept. PS11
509 So. State St.
CHICAGO 5, ILL.

WILLARD 1 1/2 VOLT STORAGE BATTERY



A rechargeable, wet plate battery good for years of service. Brand new. Battery is shipped dry but fully charged—any battery station will add acid. Use singly or in multiples for radio sets, bell circuits, alarm systems, etc. Measures 5 1/4 x 4 x 3 inches. Ball floats indicate condition of charge. Shp. wgt. 4 lbs. Stock No. 297—Each Only. **\$2.95**



Electron microscope, perfected at RCA Laboratories, reveals hitherto hidden facts about the structure of bacteria.

Bacteria bigger than a Terrier

Once scientists, exploring the invisible, worked relatively "blind." Few microscopes magnified more than 1500 diameters. Many bacteria, and most viruses, remained invisible.

Then RCA scientists opened new windows into a hidden world—with the first commercially practical electron microscope. In the laboratory it has reached magnifications of 200,000 diameters and over. 100,000 is commonplace...

To understand such figures,

picture this: A man magnified 200,000 times could lie with his head in Washington, D. C., and his feet in New York... A hair similarly magnified would appear as large as the Washington monument.

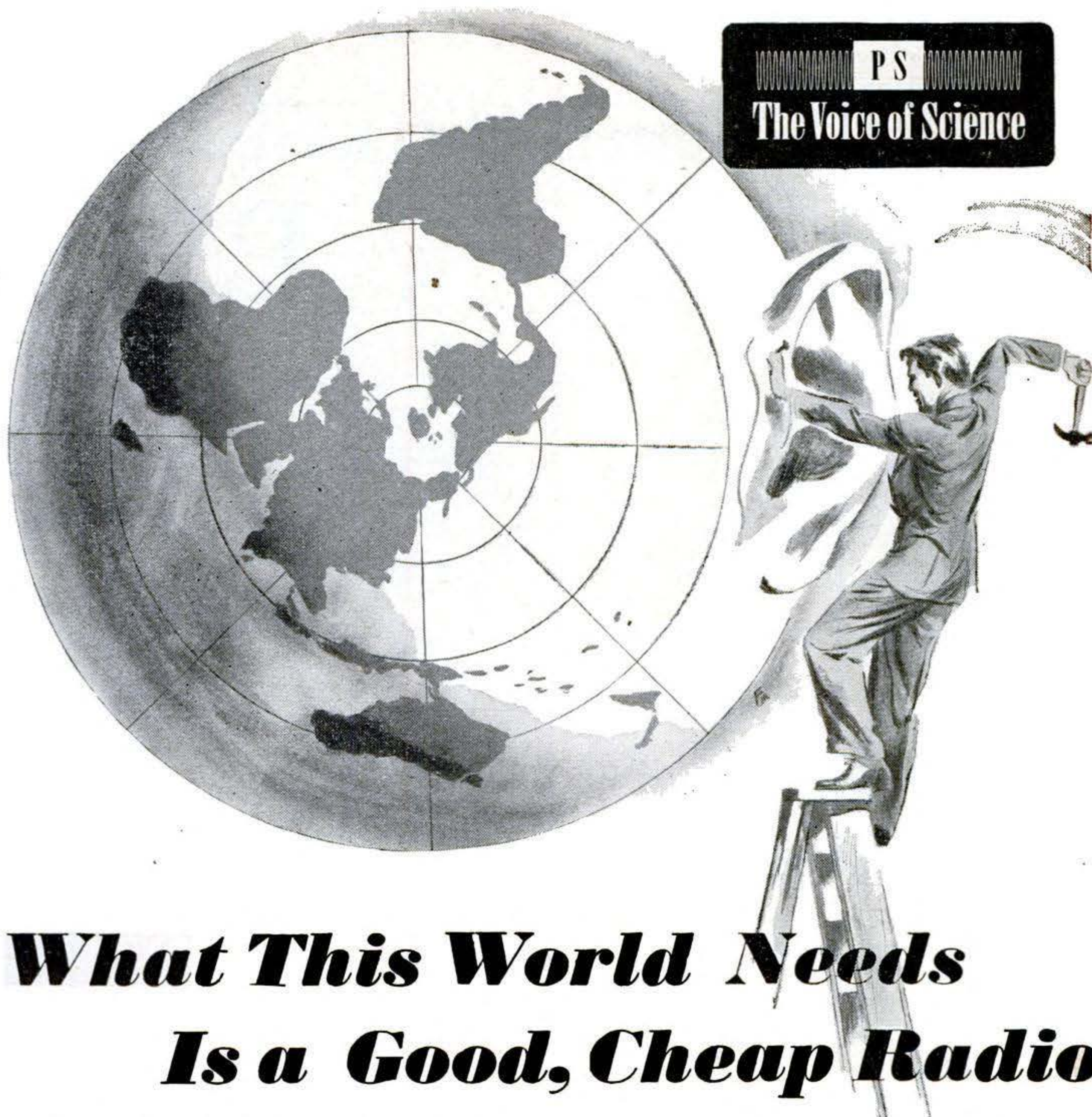
Scientists see both bacteria, and viruses—and have even photographed a molecule! Specialists in other fields—such as industry, mining, agriculture, forestry—have learned unsuspected truths about natural resources.

Development of the electron microscope as a practical tool of science and industry is another example of RCA research at work. This leadership is part of all instruments bearing the names RCA, and RCA Victor.

When in Radio City, New York, you are cordially invited to see the radio, television and electronic wonders at RCA Exhibition Hall, 36 West 49th Street. Free admission. Radio Corporation of America, RCA Building, Radio City, New York 20.



RADIO CORPORATION of AMERICA



What This World Needs Is a Good, Cheap Radio

A RADIO set helped win the war. They called it the VT fuse, remember? Uncounted thousands of these compact and costly radios were shot off.

A radio set could help win the peace. Basic receivers so cheap they could be handed around like books. So simple they could be assembled with primitive materials. So easy to operate that an intelligent if illiterate peasant could twist them to get his own language.

We live in a country where the day-old newspaper is the cheapest wrapping for garbage. It is hard for us to realize that other millions get only such information as their rulers give them. That, in fact, four-fifths of the peoples of the world have no access at all to what is going on.

In our one-fifth of the world, radio development has naturally been toward better

sets, beautifully made, for high-quality reception. But industrial science and engineering can work both ways. And in the forefront of radio are the amateurs and experimenters. The collective know-how could soon develop the *minimum* sets that would provide the *maximum* of people with communications.

Basic radios, receiving national and world programs, would let a would-be citizen of the world anywhere know what was going on in his world—and in his country.

In the present conflict of meanings, freedom to listen is as vital as freedom to speak. It might even be cheaper, if we have something to say, to pass out hearing aids than to shoot off the little radios in shells and bombs.

Perry Githens

He's learning fast— he's got P.A.*

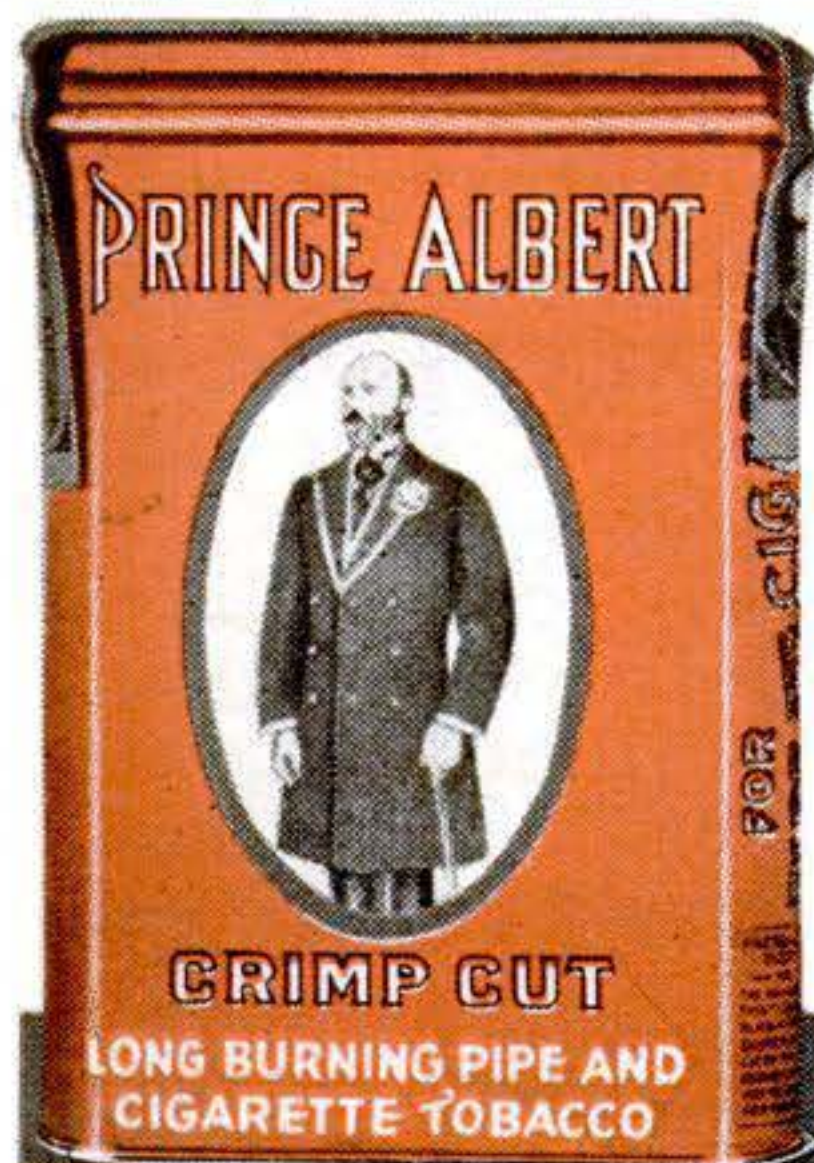


● He's learned that a woman appreciates a man with Pipe Appeal—that extra something that distinguishes a pipe smoker. And he knows that with Prince Albert in his pipe, he's got a mild, tasty smoke.

R. J. Reynolds Tob. Co.
Winston-Salem, N. C.

P.A.* means **P**ipe **A**ppeal
means **P**rince **A**lbert

NEW HUMIDOR TOP
Locks In the Freshness and Flavor!



When you pack your pipe with P.A., you're sure of getting a smoke that's really mild, really rich tasting. Prince Albert's choice, crimp cut tobacco is *spe- cially treated* to insure against tongue bite. No wonder P.A. is America's largest-selling smoking tobacco!

"P.A.'S COOL CRIMP CUT
IS JUST RIGHT FOR
CIGARETTE MAKIN'S"

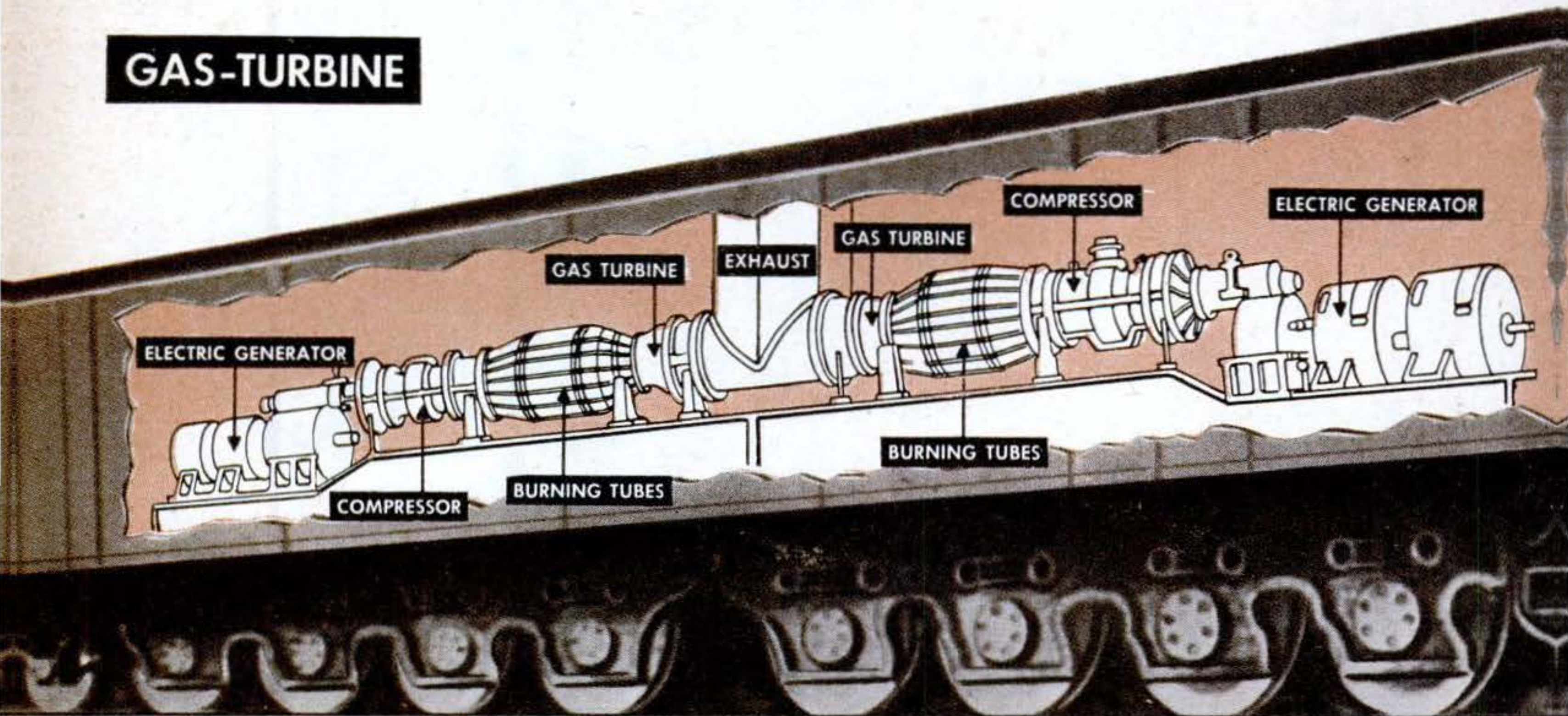


THE NATIONAL JOY SMOKE



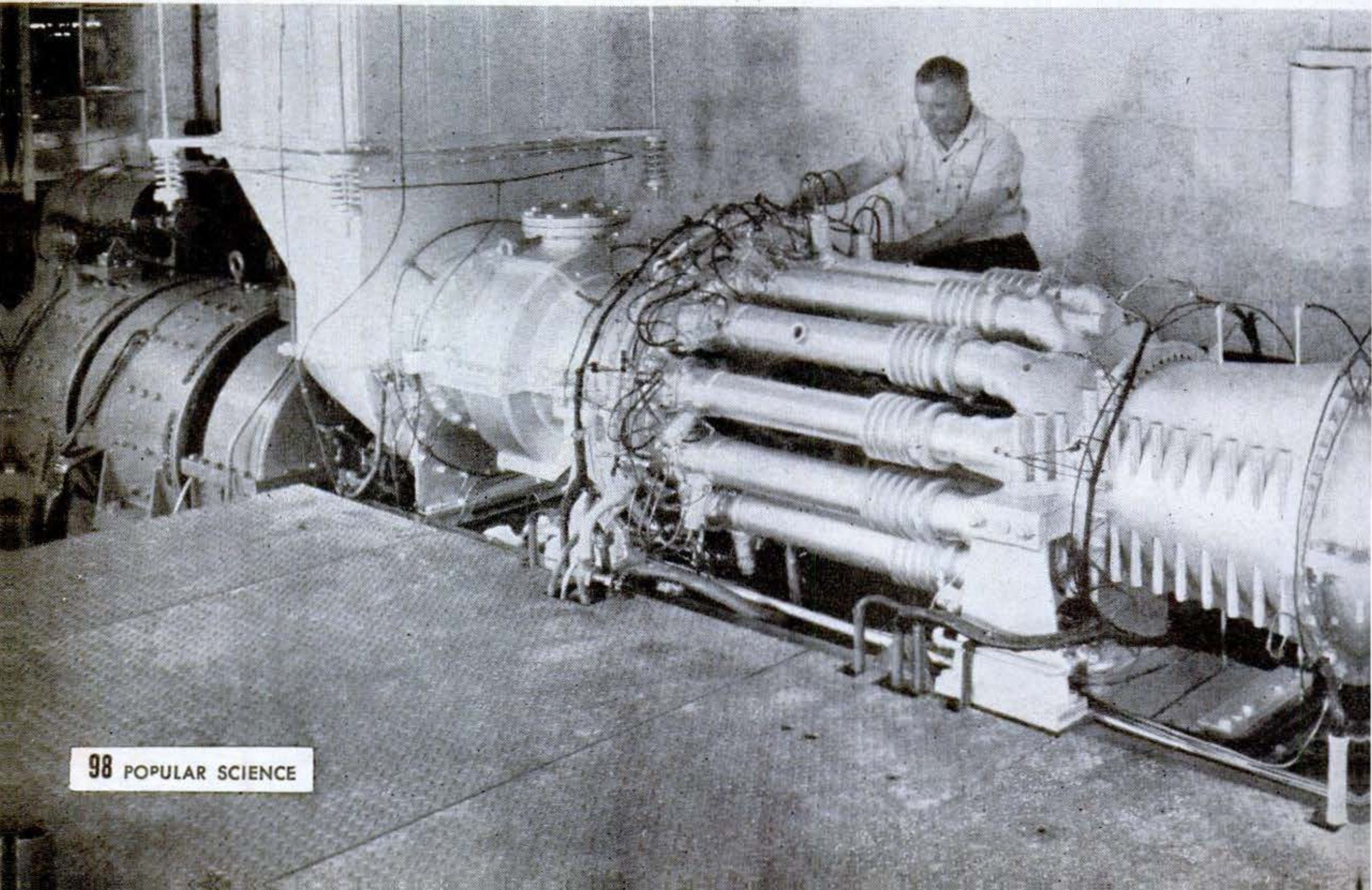
Stacking Up with the Best . . . When the huge, oval-shaped section above swung gently into place, it topped off the world's largest ocean-going smokestack. The slim, streamlined funnel is 53 feet long and 46 feet high. It is shown being installed on the *Caronia*, new 34,000-ton luxury liner now nearing completion at Clydebank, Scotland, for the Cunard White Star Line. The stack, weighing 125 tons, will be the *Caronia's* only funnel and will house machinery as well as exhaust stacks for her oil-fired steam turbines. Largest passenger ship now being built, the *Caronia* has an over-all length of 714 feet and a 91-foot beam.

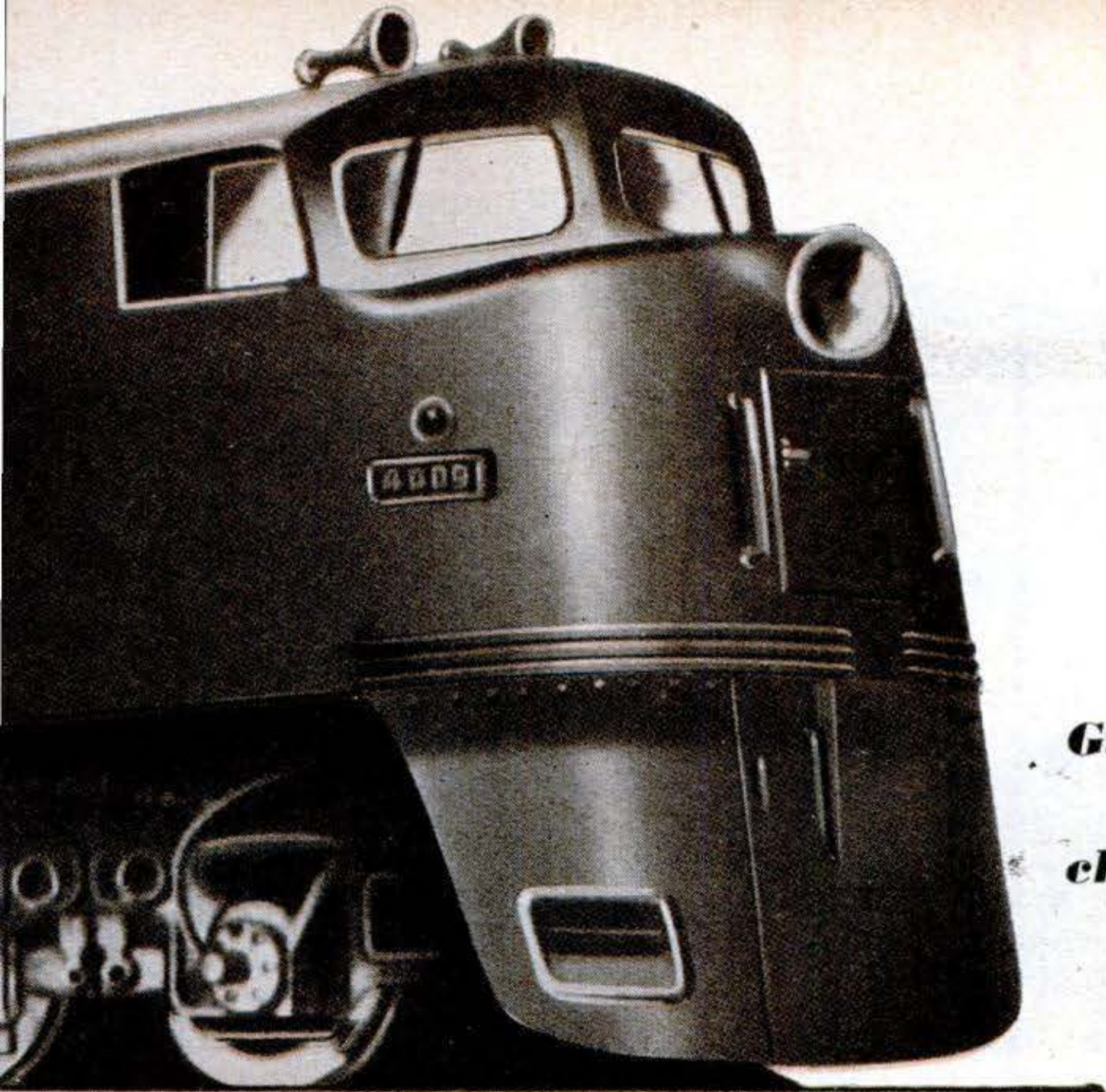
GAS-TURBINE



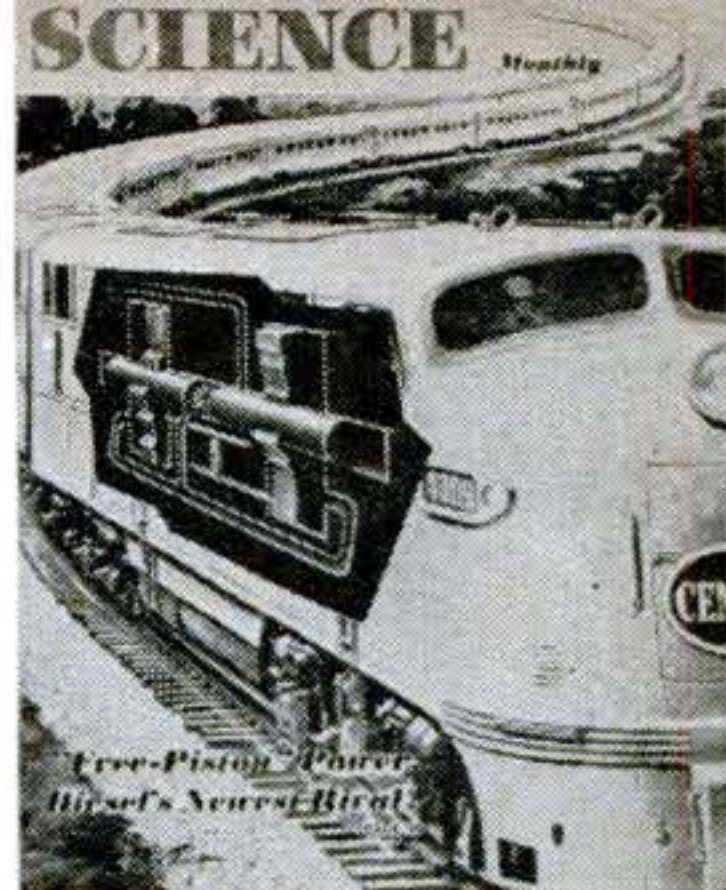
The New Iron Horses

A single locomotive, as shown at top of page, could house four 2,000-hp. gas-turbine units.





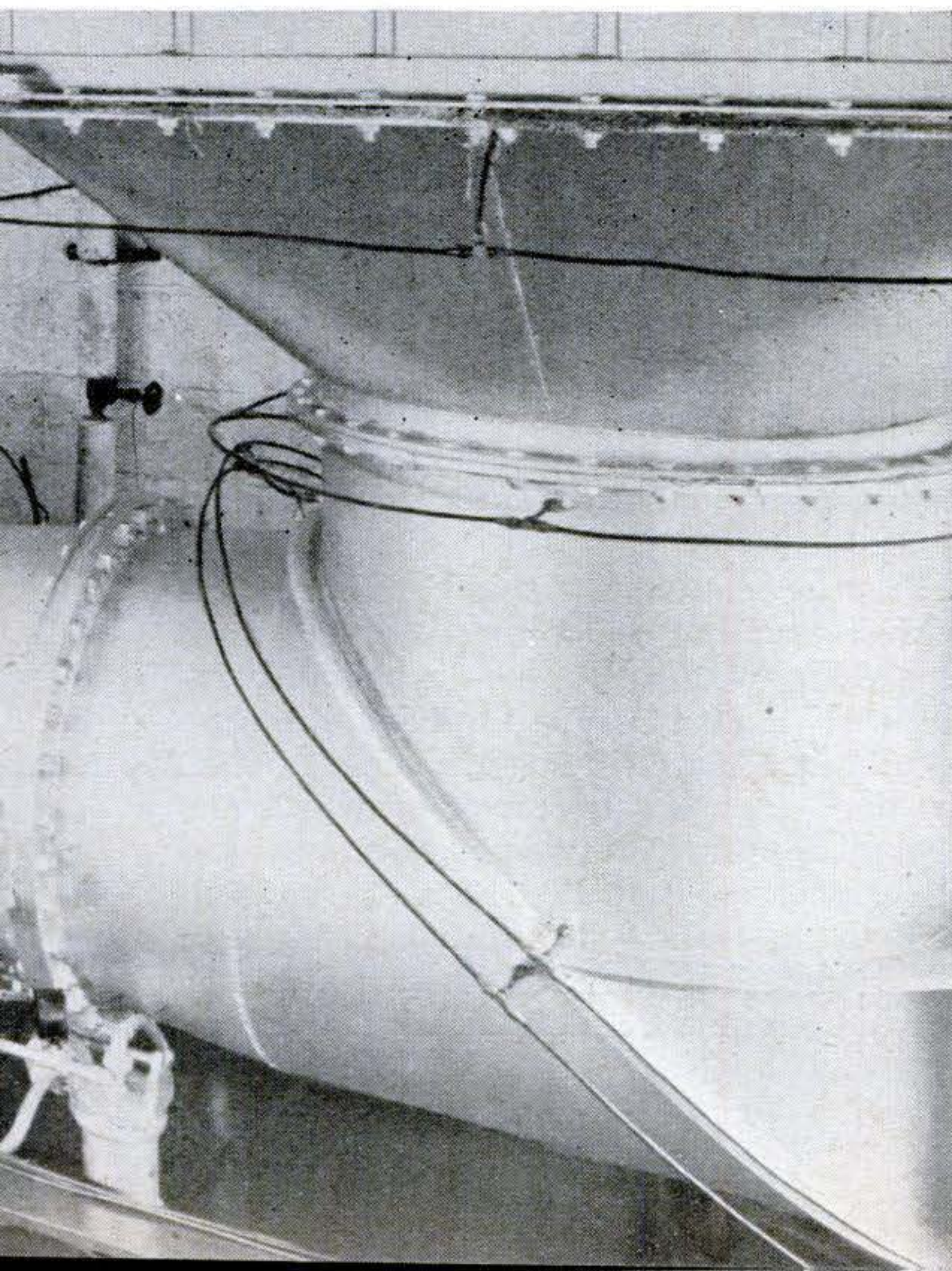
Cover drawing
by Ray Pioch



**Gigantic gas turbines and
secret free-piston engine
challenge 100-year rule of
coal and steam locomotives.**

Don't Drink Water.

The Westinghouse turbine is shown below.



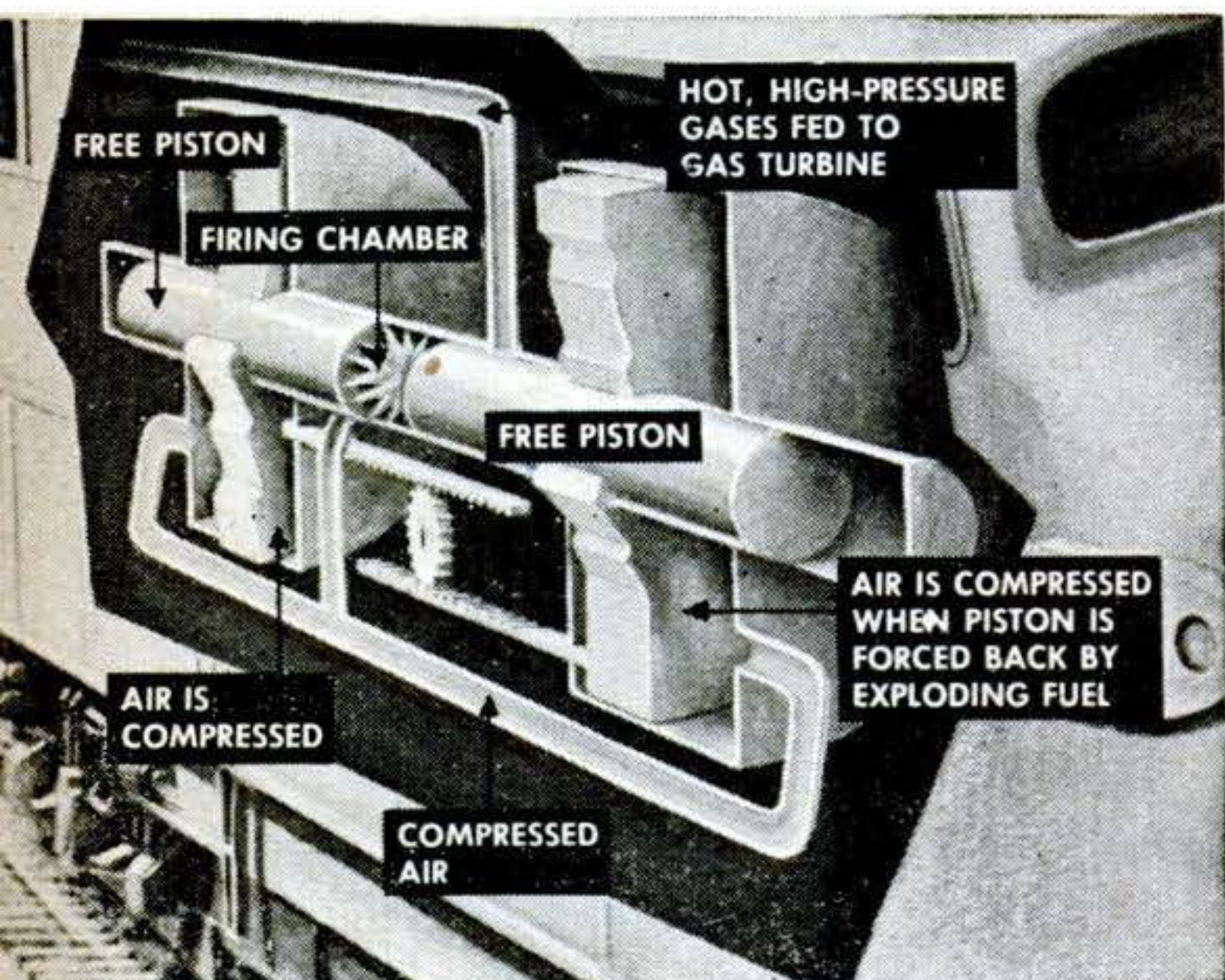
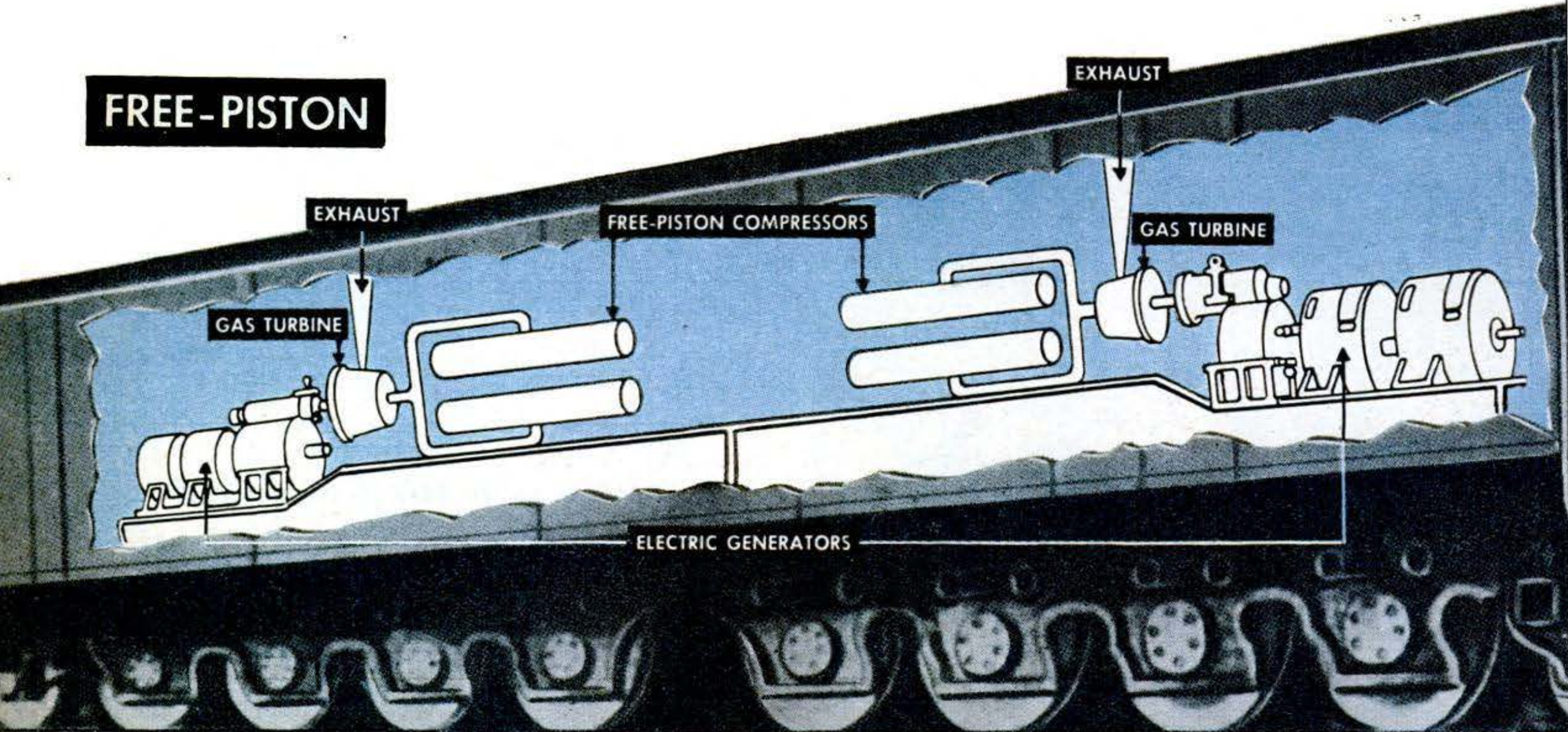
By George H. Waltz, Jr.

THREE brand-new kinds of mechanical steeds are being groomed for the never-ending race of the iron horses.

For more than a hundred years, steam and coal ruled supreme on America's rails. Then came the all-electric and the Diesel-electric engines. They brought higher operating efficiency, smoother starting, and greater flexibility. In 1946 three-fourths of the locomotives made by one of the country's leading producers were steam engines and only a fourth were Diesels. But this year only 8 percent of this same company's production will be steam—the other 92 percent will be Diesel. It looks as if the spume of smoke and steam that has marked the railroad for a century will pass away from the American scene. So may the water tank. The newest iron horses don't drink water.

And, despite its apparent triumph, the Diesel is by no means a sure winner. Three revolutionary types of locomotives are now entering the race: a gas-turbine

FREE-PISTON



Free-piston locomotive. Although secrecy surrounds the details of this newest entry in the race of the iron horses, experts picture it as a variation of the basic gas-turbine locomotive. To obtain a higher operating efficiency, a mechanical compressor and gas producer is substituted for the turbinelike compressor and combustion tubes of the conventional gas turbine. Opposed pistons, which are "free" in that they are not connected to a drive shaft, travel back and forth in a single cylinder. A central firing chamber keeps the pistons sliding in and out. As the pistons move back, they compress the air behind them. This compressed air is then fed to the firing chamber and mixed with the gases of combustion from the exploding fuel oil. The superheated, high-pressure mixture of gases is used, finally, to turn the propellerlike blades of a gas turbine.

locomotive, a free-piston locomotive, and a coal-burning gas-turbine locomotive. They may well challenge the Diesel's lead. All are well along in their experimental stages. Test models of at least two of them should be rolling along the rails late next year.

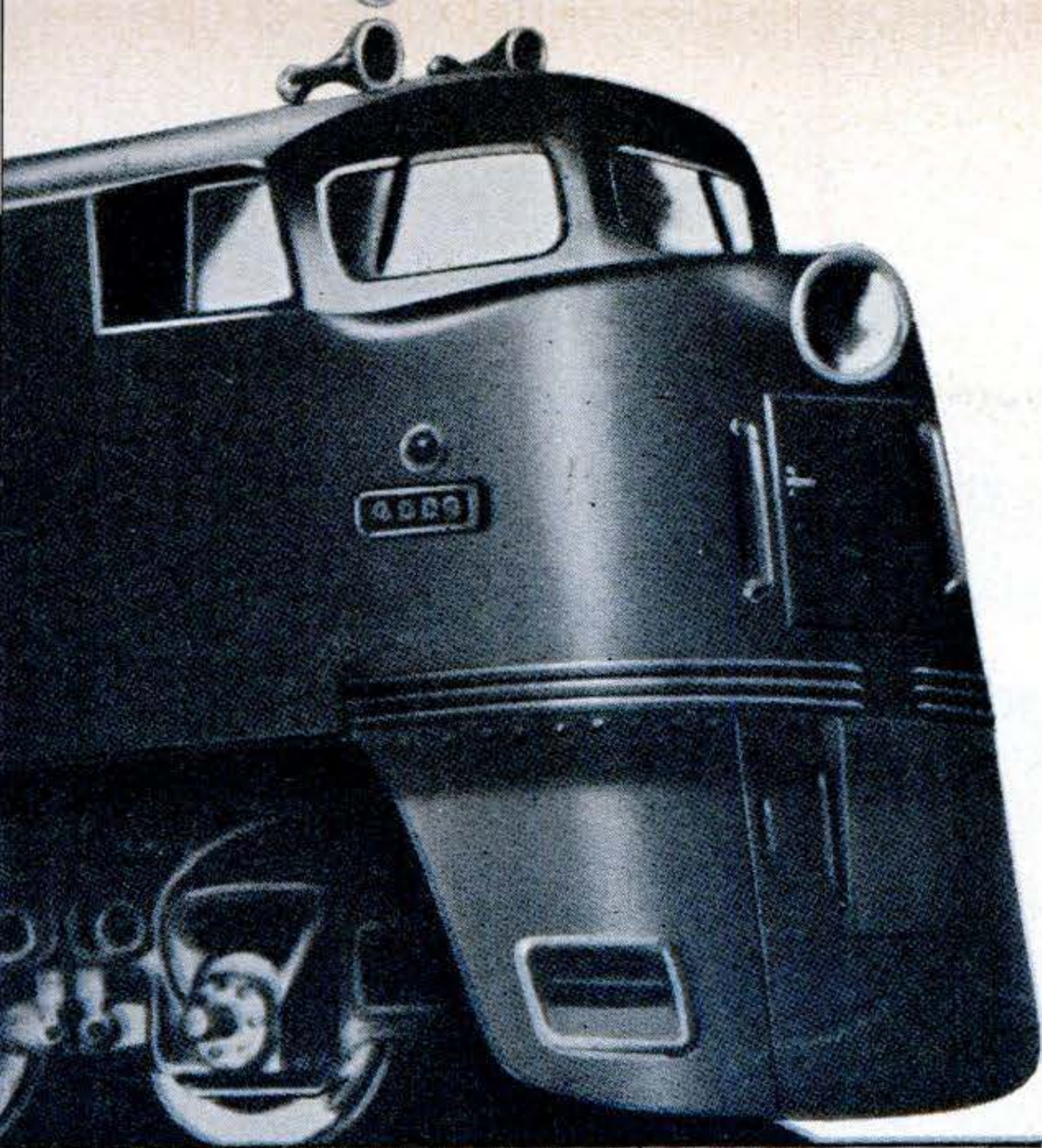
The prime movers in all three of these new locomotives are basically gas turbines. They are products of lessons learned while perfecting the turbojet engine for aviation use.

The gas turbine itself is not new. Its theory was fairly well developed 60 years ago. But it was the turbojet work during World War II that finally brought forth materials that could withstand the extremely high temperatures, ranging above 1,300° F., that are needed to make a gas turbine operate efficiently.

Two of the pioneers in designing engines for jet planes—Westinghouse and General Electric—are now fathering the gas turbine for railroad use. Both have full-size test models of locomotive gas-turbine power plants in operation, and both have completed plans for actual gas-turbine locomotives.

In a locomotive, the simplest kind of gas turbine can be used. Fundamentally, this is nothing more than a hot-air engine burning fuel oil. It has only three major parts—a turbinelike air compressor, a series of combustion chambers or tubes in which the fuel oil is burned to produce hot gases, and the gas turbine itself (PS, Sept. '48, p. 138).

Both the turbine and the air compressor are mounted on the same shaft. Hence, in actual operation the turbine drives the com-



pressor. Air from the atmosphere is sucked into one end, compressed and mixed with fuel oil, which then is burned to heat the air. Finally, the combined hot, high-pressure gases are exhausted through the propellerlike blades of the turbine. This is the power wheel. A generator geared to the turbine shaft produces electricity to turn the locomotive's driving motors.

A locomotive gas turbine of this type has been on laboratory test since 1946 at the Westinghouse plant in South Philadelphia. Though capable of putting out 2,000 hp., it is less than 27 ft. long and weighs less than 20 tons. When producing its peak power, this Westinghouse turbine whirls at a speed of 9,200 r.p.m. (Gears step down the speed of the turbine shaft to the 1,200 r.p.m. needed to drive the direct-current generator.)

Twenty-two rows of blades in the compressor, whose tips spin at 502 m.p.h., suck in 55 tons of air every hour and raise its pressure to five times that of the outside air. From the compressor, the air is fed into 12 slim combustion tubes clustered like the cartridge chambers of a revolver around the spinning central shaft that couples the turbine to the compressor. Here it is mixed with the injected fuel and ignited. The fiery mixture of heated compressed air and hot gases blows through the turbine with terrific force.

To withstand the great heat and the wear and tear, the blades of the gas turbine are made of an alloy of cobalt, chromium, and

tungsten. Because this material is much too hard to machine and too brittle to forge, the blades were cast by the revived "lost wax" method—a technique first tried by Benvenuto Cellini in the 16th Century (PS, Sept. '46, p. 124).

Although the efficiency of a gas turbine of this type (about 25 percent) is less than that of a Diesel (about 37 percent), the gas turbine can burn a much cheaper grade of oil. This makes its over-all fuel cost per mile competitive with that of the Diesel. Beyond efficiency and fuel cost, however, the gas turbine has other qualities that make it particularly well suited to railroad use.

Its relatively small size allows a large amount of potential horsepower to be stabled in a small space. This makes possible the construction of locomotives that weigh only two-thirds as much and are only one-half as long as Diesel locomotives of the same power. Two of the Westinghouse units, producing a combined 4,000 hp., can be housed side by side in a locomotive no larger than a 2,000-hp. Diesel. It is this type of two-unit gas-turbine locomotive that Westinghouse has under construction. Its weight per horsepower, one of the principal measuring sticks used in gauging mobile power plants, will be considerably less than that of any other self-sufficient locomotive.

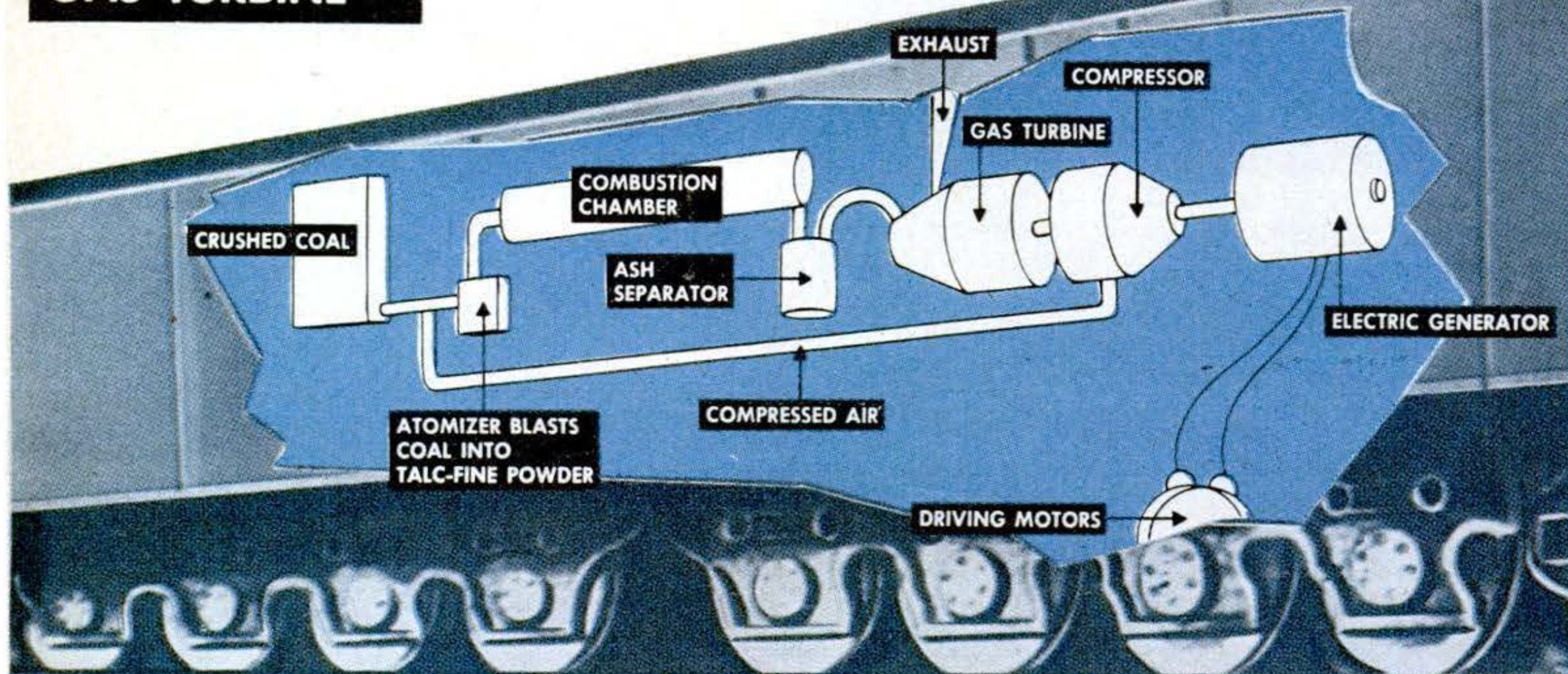
What's more, argue the advocates of the gas turbine, it requires only a minimum of lubrication (a major consideration in the operation of a Diesel), uses no water, and presents no ash problem. It has no reciprocating parts and is easy to maintain and service.

Free-Piston Engine Kept Secret

Darkest horse in the race of the new iron horses is the "free-piston" locomotive. This entry is being groomed behind locked laboratory doors. Although Gwilym A. Price, Westinghouse president, announced more than six months ago that his company was cooperating with another large Eastern manufacturer in the construction of such a locomotive, the engineers of both companies are reluctant to talk about the actual details.

It is known, however, that the development work is progressing, and a poll of turbine and combustion experts reveals a general picture of how a free-piston locomotive could operate. The major difference between it and a conventional gas turbine is that it has a new kind of combined mechani-

COAL-BURNING GAS-TURBINE



This gas-turbine locomotive burns finely powdered coal to produce hot, high-pressure gases.

cal compressor and gas producer in place of the tandem compressor and combustion tubes.

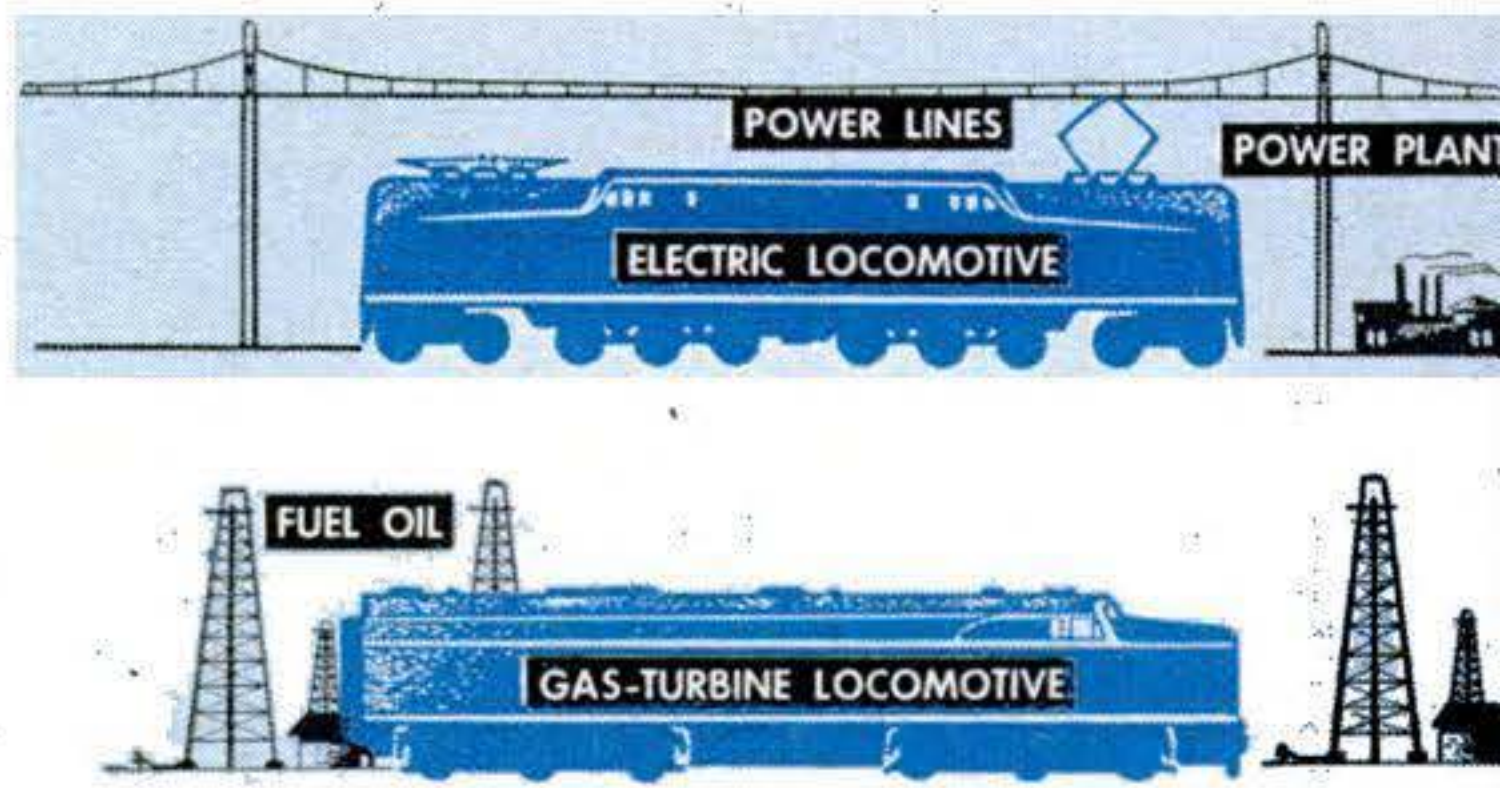
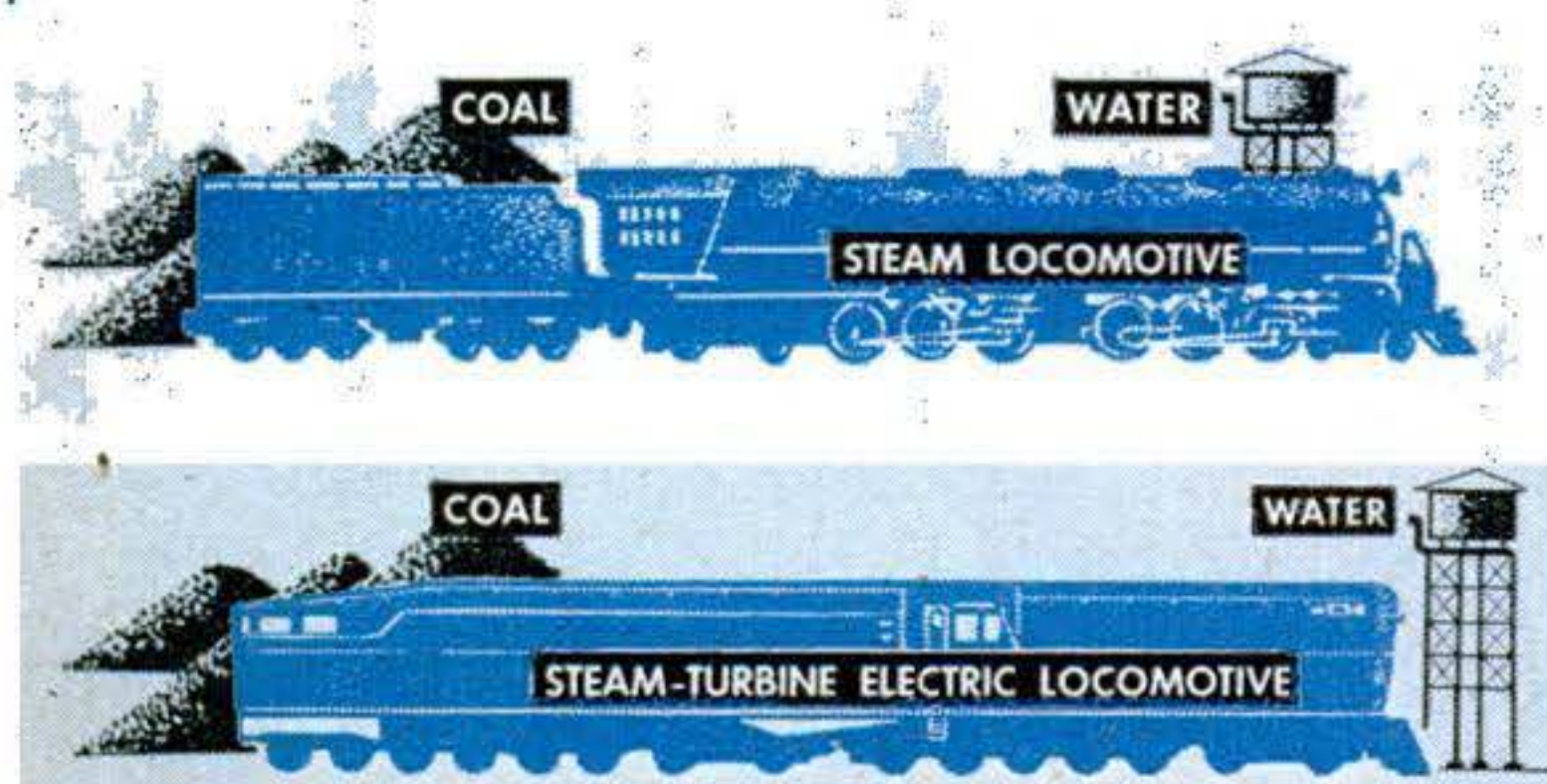
In this free-piston power plant, opposed pistons travel back and forth in a cylinder. Unlike the pistons in an automobile engine, they are not connected to a drive shaft. Their function is not to drive something but to supply the hot gases for a gas turbine. A firing chamber in the center keeps the pistons flying back and forth. Their action compresses the air behind them, causes fuel oil to burn in this compressed air as it is fed into the combustion chamber, and releases a mixture of the hot gases at each stroke. These hot gases then are fed to a gas turbine, which in turn drives an electric generator to

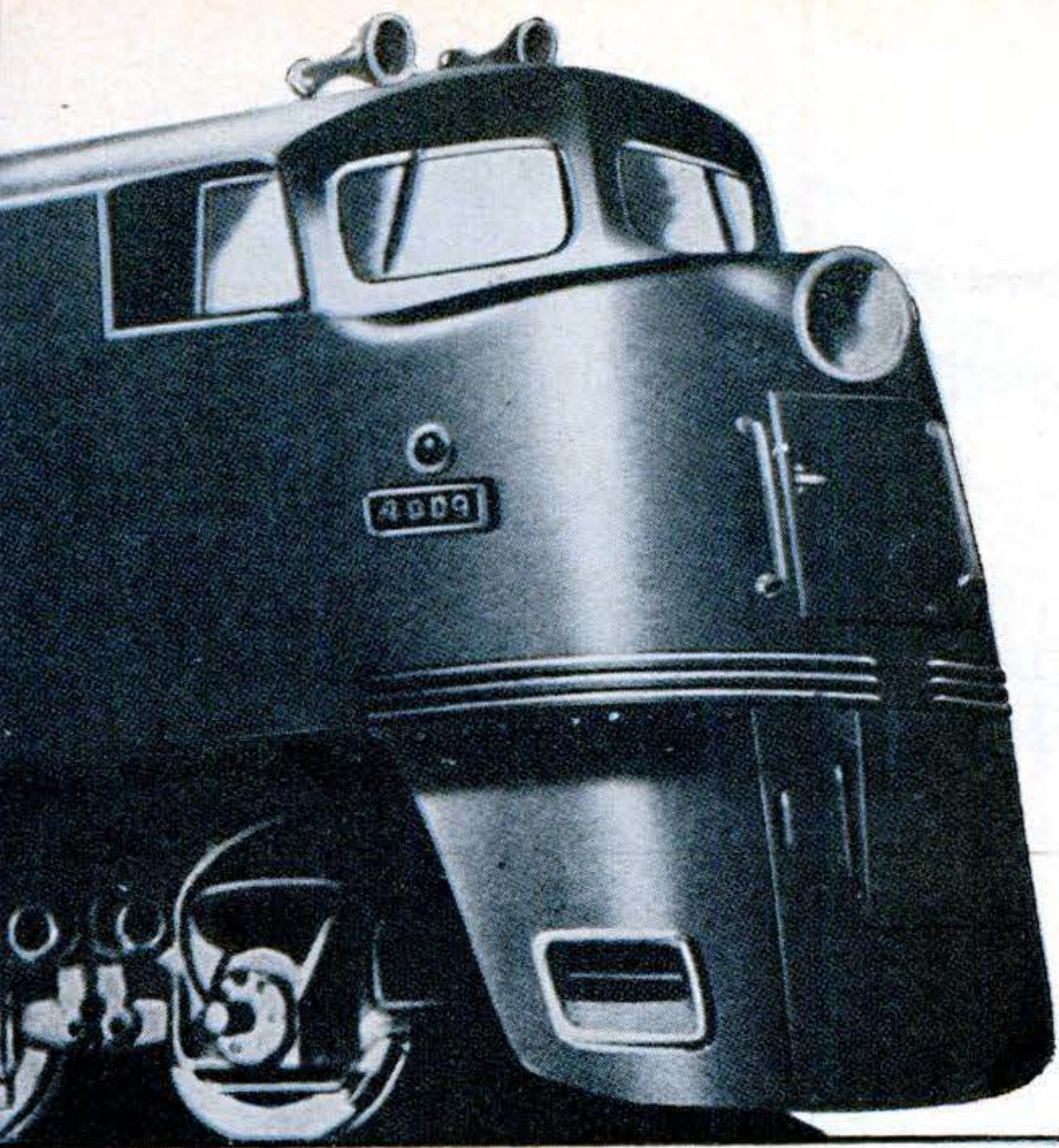
provide power for the locomotive's driving motors.

The primary advantage of this free-piston type of mechanical compressor over the conventional compressor is said to be its greater efficiency. The free-piston gas-turbine is expected to be just about as efficient as the Diesel. In fact, the firing chamber and its two opposed pistons operate on the two-cycle Diesel principle, but instead of producing driving power on a shaft they produce hot, high-pressure gases.

Despite the wide interest in oil-burning gas turbines, however, oil has by no means completely replaced coal in the thinking of the builders of the super-locomotives of tomorrow. Already on the rails are four coal-

A WHO'S WHO OF RAILROAD LOCOMOTIVES





Gas spins turbine driving electric generator.

burning steam-turbine locomotives. Three, owned and operated by the Chesapeake and Ohio Railway, have their steam turbines geared to electric generators to provide power for the motors that turn their driving wheels. The fourth, pulling crack trains for the Pennsylvania Railroad, has its turbine geared directly to the driving wheels.

These locomotives are seeing continuous service and show increased efficiency over the regular coal-burning steam locomotive. With more efficient steam-generating boilers, now being worked on by Babcock and Wilcox, steam-turbine locomotives may more nearly match the relatively high efficiencies claimed by the Diesel engine and the gas turbine.

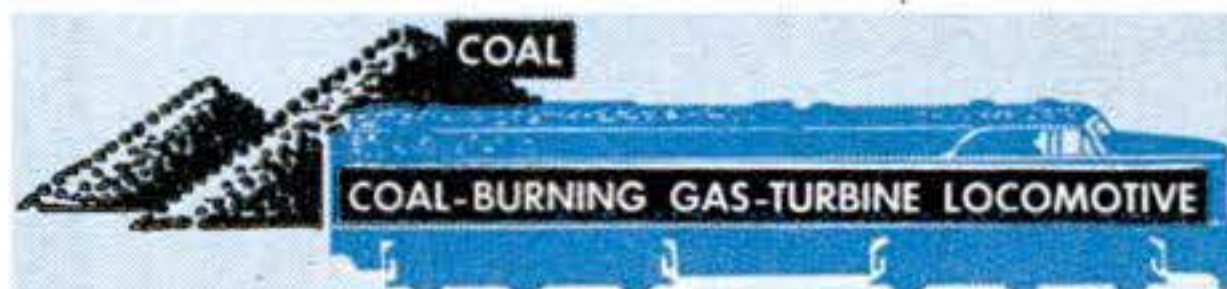
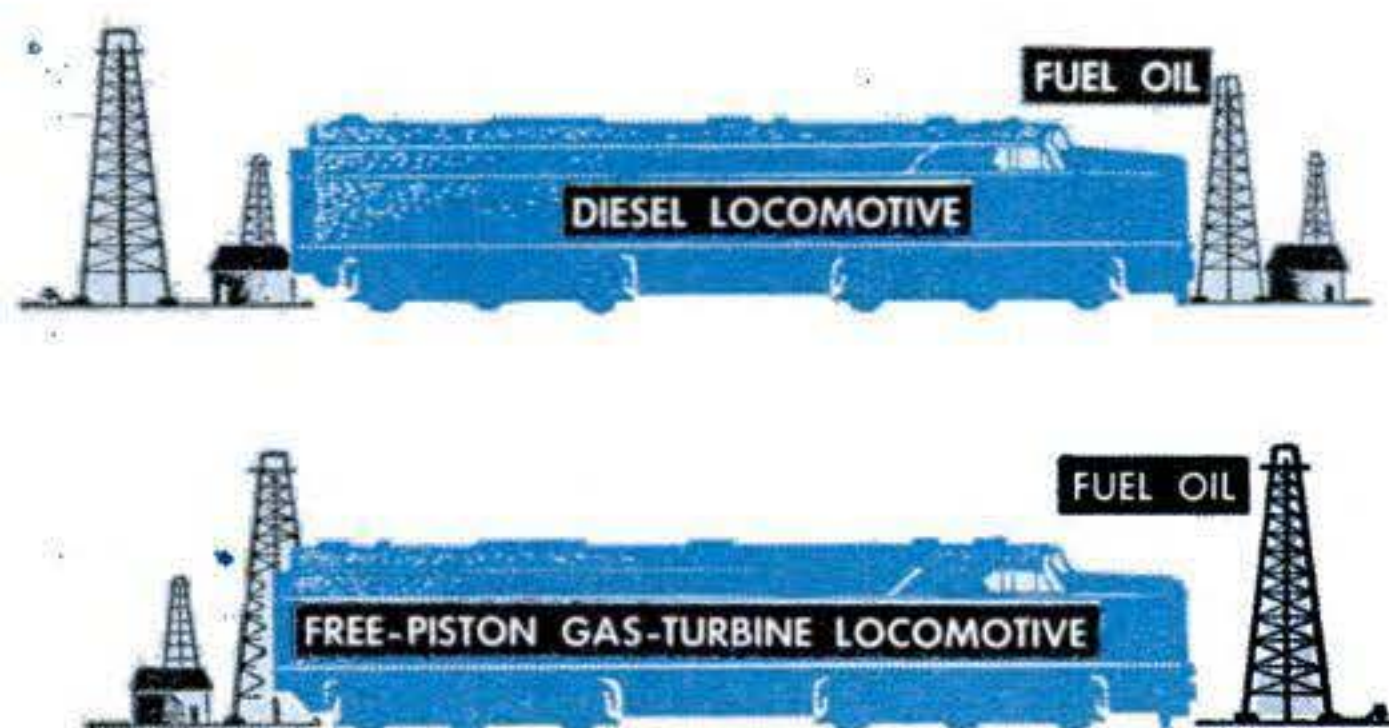
The favorite entry of the coal enthusiasts, however, is the coal-burning gas-turbine locomotive. At the moment, at least half a dozen organizations are experimenting with the possibility of using coal as the source of the gases needed to drive a gas turbine. If they succeed and are able to produce a locomotive that can match or outmatch the efficiency of the Diesel—and many experts think that they can—coal once more will rule the rails. Such a locomotive would combine the advantages of the gas turbine with the low cost and the large resources of soft coal.

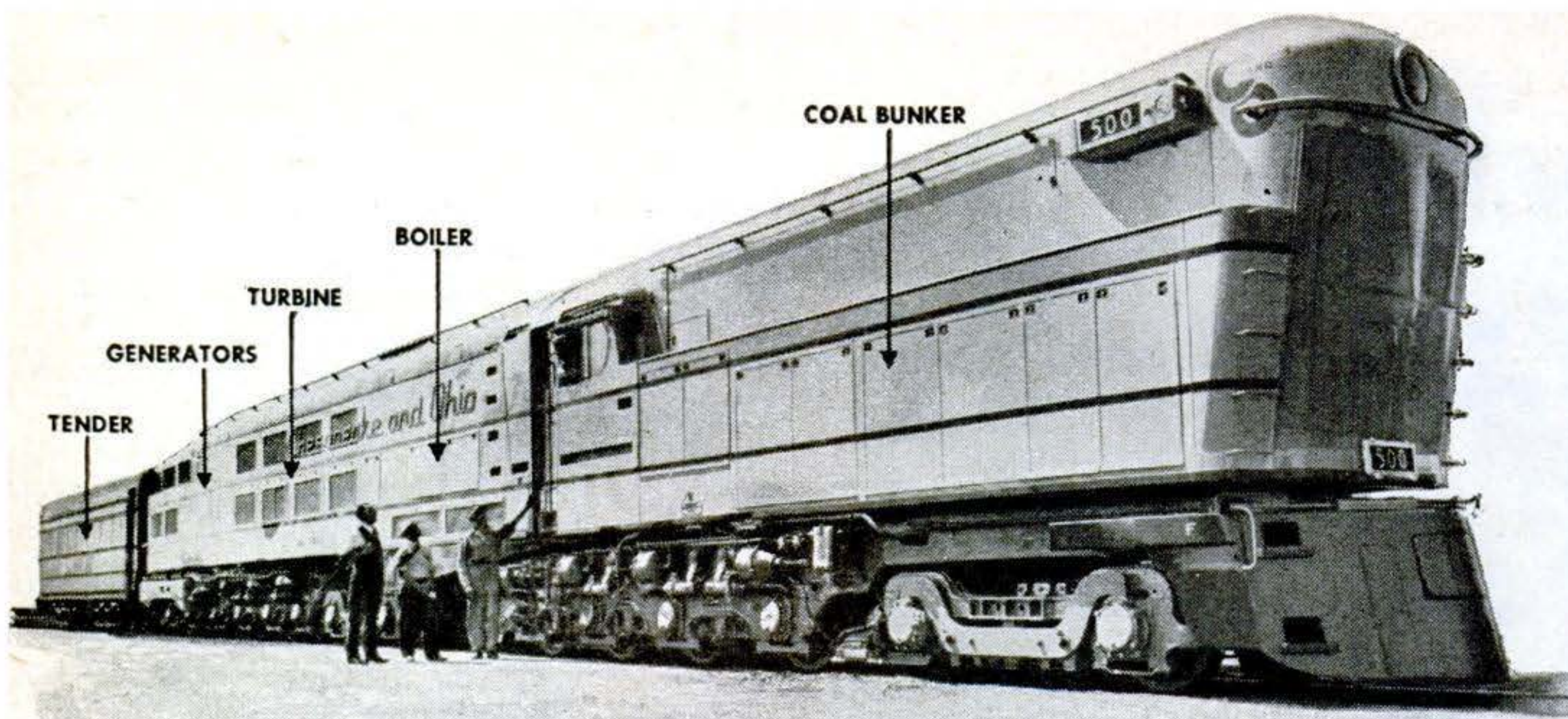
Two big problems have, up until now, stood in the way of a practical coal-burning gas turbine. One is how to grind the coal to talcum-powder fineness, so that it can be readily and easily gasified. The other is how to remove the ash and foreign matter from the resulting gases, so that they will not pit and eventually destroy the blades of the gas turbine.

Among those who feel that these two major problems have been licked is John I. Yellot, director of the Locomotive Development Committee of Bituminous Coal Research, Inc. Supported by nine major railroads and four large coal producers who have sponsored a \$2,800,000 research program, his committee has been attempting to work the bugs out of the coal-turbine theory.

A gas turbine once destined for Russia under lend-lease is now being altered at the committee's Dunkirk, N. Y., laboratory to use powdered coal instead of oil as fuel. In Yellot's version of the coal turbine, crushed coal will be "fluidized" by conveying it, under high air pressure, to a "coal atomizer." Here, as the coal passes through a small nozzle the rapid expansion of the air trapped inside it will literally blow it apart to form a powder as fine as talc. The finely

SHOWING WHERE THEY GET THEIR POWER





In this new Chesapeake and Ohio locomotive, steam from coal-fired boilers turns a turbine.

powdered coal and high-pressure air then will be fed to a combustion tube to be burned and transformed into hot air and gases.

Any sand and grit in the hot gases will be removed by a fly-ash separator similar to the centrifugal filters used on Army tanks to whirl dust out of the air-intake tubes of their engines. From the ash separator, the superheated gases will flow to the gas turbine, which in turn will drive an electric generator to provide the power for the locomotive's

driving wheels. The locomotive's speed will be controlled by regulating the flow of coal and air to the "atomizer."

Such a coal-burning gas-turbine locomotive, according to Yellot, would have an efficiency of about 20 percent. This seems low until you consider that the average over-all efficiency of a present-day coal-burning steam locomotive seldom is much more than 5 percent. Compared on a fuel-cost basis, the 20-percent-efficient coal-burning gas-turbine locomotive would far outrun the Diesel-electric. On a dollar's worth of fuel, the coal turbine would outdistance the Diesel two to one.

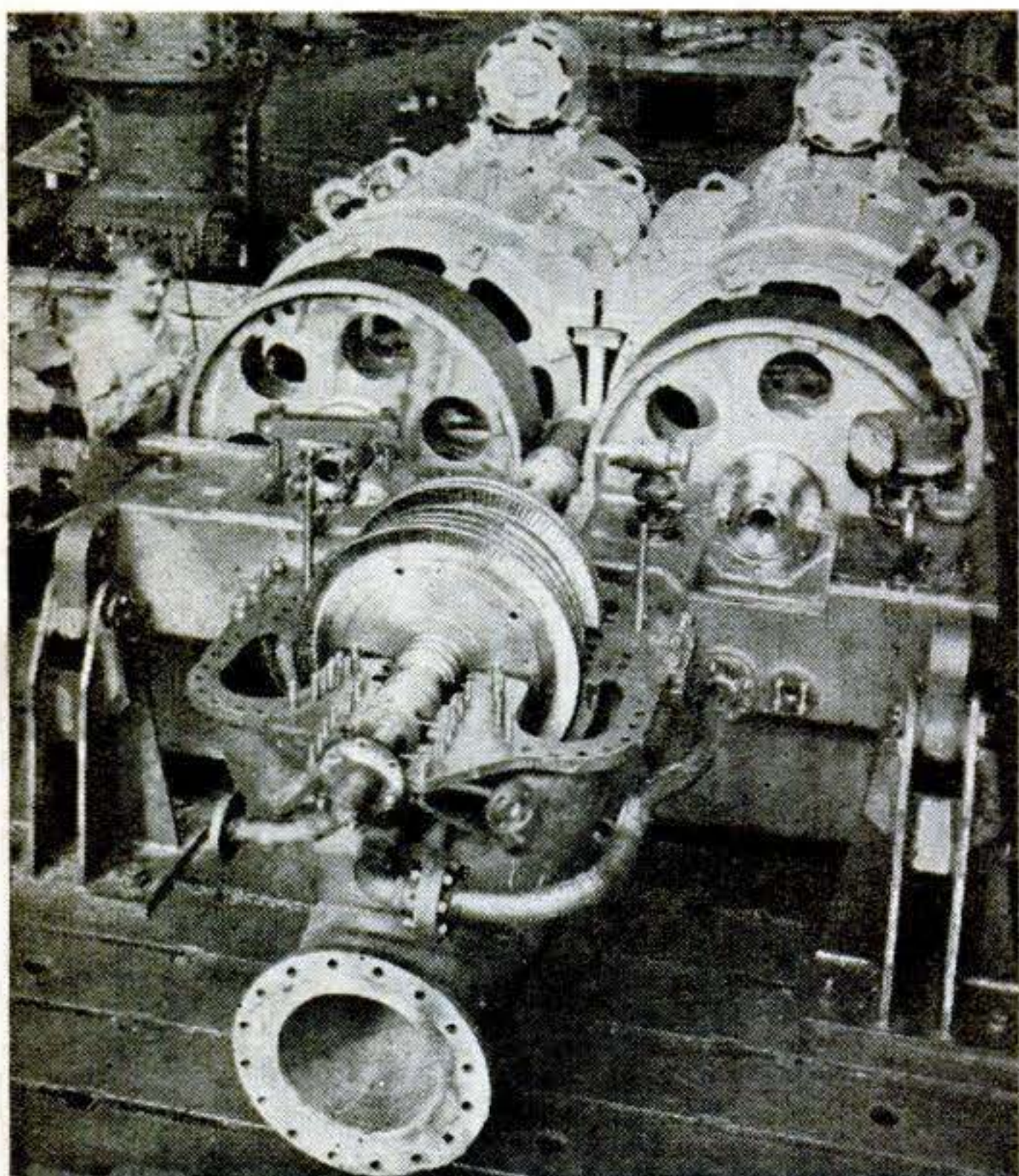
Today, locomotive research engineers are concentrating their work on the potentialities of the gas turbine. What tomorrow will bring is pretty much anyone's guess. There may be a tip-off in a recent statement by Robert B. McColl, president of the American Locomotive Company:

"Our research staff is keeping itself well informed on all new developments *including atomic power*, admittedly more remote, but still a possibility not to be overlooked."

Better hold your hats when the old iron horse gets a diet of atomic oats. **END**

Jets Slightly Delayed

ALTHOUGH engineers have known of the jet principle since the days of Heron of Alexandria at the start of the Christian era, inadequate materials delayed its practical use until after the beginning of World War II. Today, America's young jet industry has already outstripped the rest of the world combined in production capacity, says Westinghouse.



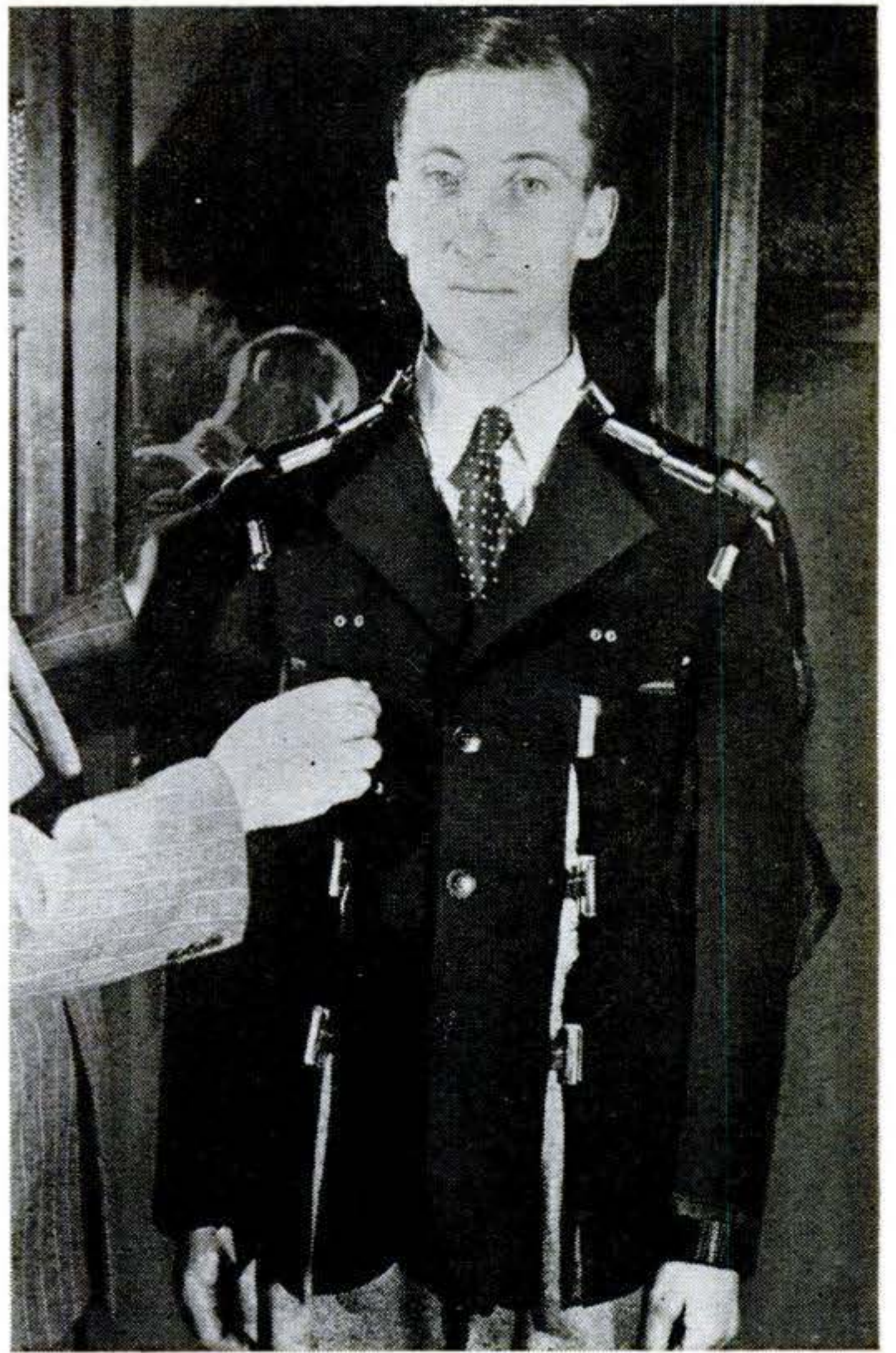
Heart of C & O steam-turbine locomotive is the turbine in foreground. It drives two electric generators through twin reduction gears (center) to power motors that drive the wheels.

Adjustable Coat Speeds Tailoring

A SHORT CUT to tailor-made suits has been invented by an Australian tailor who realized that most men are irked by the repeated fittings necessary to produce a perfect garment. Thanks to an adjustable master coat, the customers of a custom-tailor shop in a suburb of Melbourne now receive a perfectly cut suit after only one visit.

The Simpson coat, developed by George Simpson and his son after years of research, is a form-fitting jacket made up of 11 separate panels that follow the natural contours of the body instead of the seams. These panels are joined by expanding measuring tapes, in chromium-plated spring tape holders, that allow the master garment to adjust itself to the differing proportions of various clients.

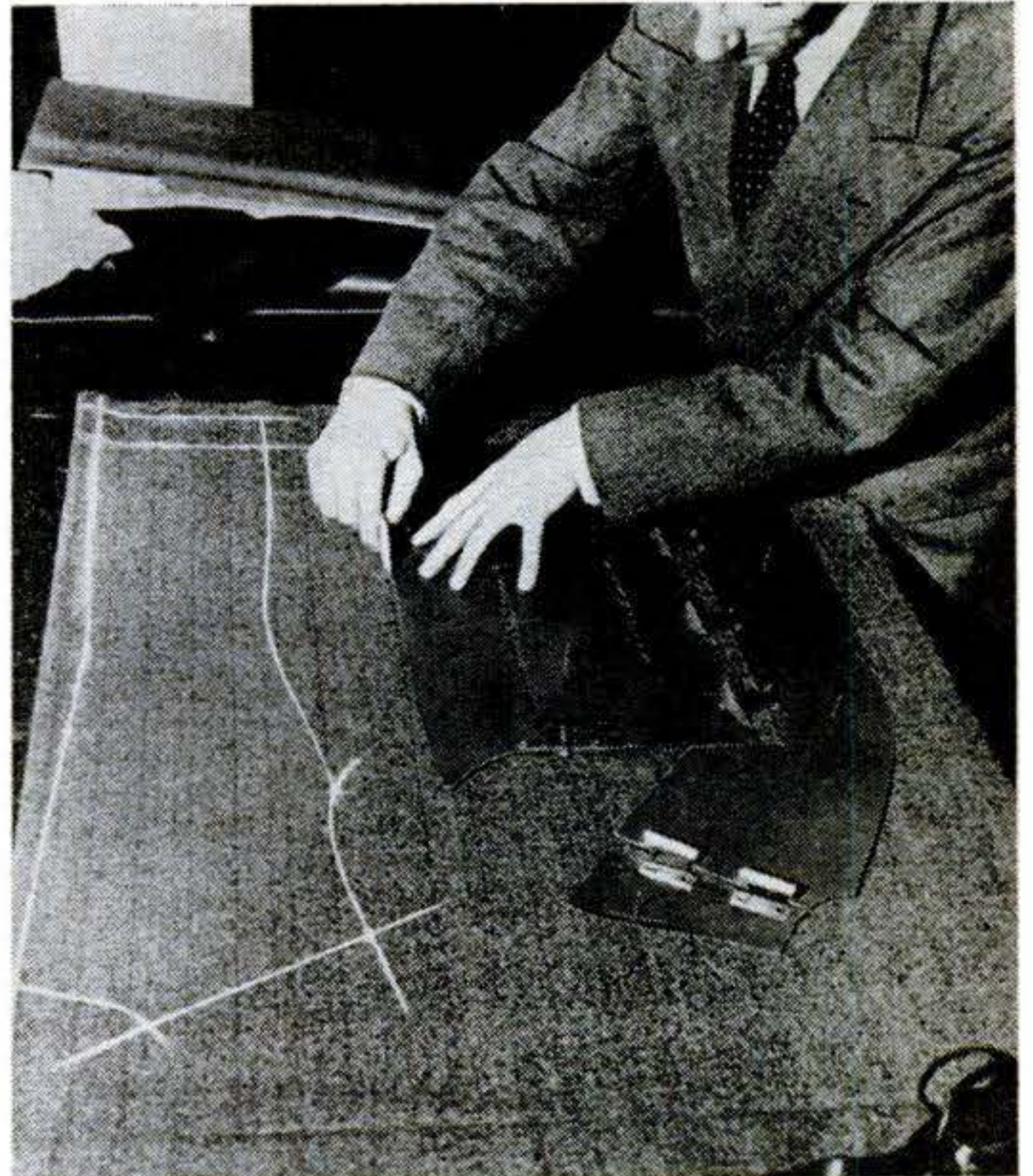
As the tailor reads the measurements on the 42 expanding tapes, he is able to determine exact variations from the standard coat. Further measurements on a graduated scale are given by a metal attachment that follows the curve of the chest to the under-arm point. The father-and-son tailor team plans to manufacture the master garments and rent them out to other tailors.



Here the master garment is being modeled by George Simpson, Jr., while his father adjusts the expanding tapes. The device can be used for both single- and double-breasted coats.

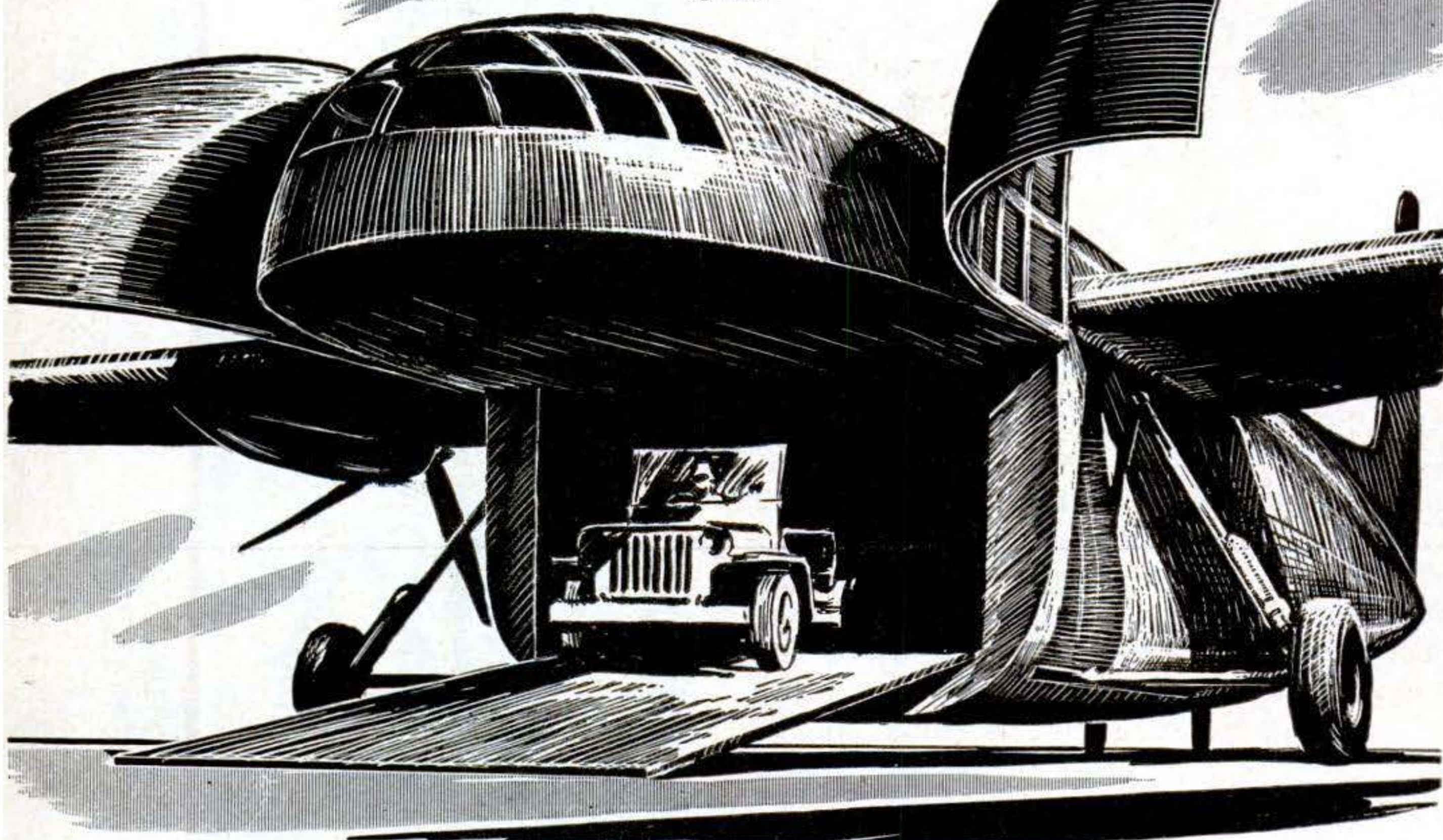


A rear view of the self-measuring tailor's aid, which its inventor claims will revolutionize the tailoring of men's suits. Planning divisions of the separate panels was most difficult job.



Correct measurements of the master garment are reproduced on a master pattern, also fitted with expanding tapes and slides. Above, this pattern is shown being used to mark material.

New Ideas from the Inventors



Cargo Plane Stoops to Load. No hoists or heavy ramps would be needed to load or unload this plane—it simply pulls up its wheels and squats. The landing gear can be partly retracted on the ground to lower

the fuselage. Curved doors in the nose then open upward, providing direct and easy access to the cargo compartment. C. Lemonier, of East Aurora, N. Y., and S. Payne, of Kenmore, N. Y., are the inventors.



Car Seat Carries Baby. Packing Junior along on those long auto trips would be a lot easier with this seat, patented by B. Glatstein, of Muscatine, Iowa. When a panel in the front of the backrest is pulled down, it forms a baby's seat. A similar panel in the rear of the seat can be lowered, so that the two together form a small bed.



Hand Pump Clears Drains. Water and suction are teamed up in this invention by C. Davis, of Los Angeles, to clear clogged sink drains. A flexible cup is pumped up and down over the drain by a handle hooked under one faucet for leverage. Meanwhile, water squirts into the drain from the other faucet through a hose in the cup.

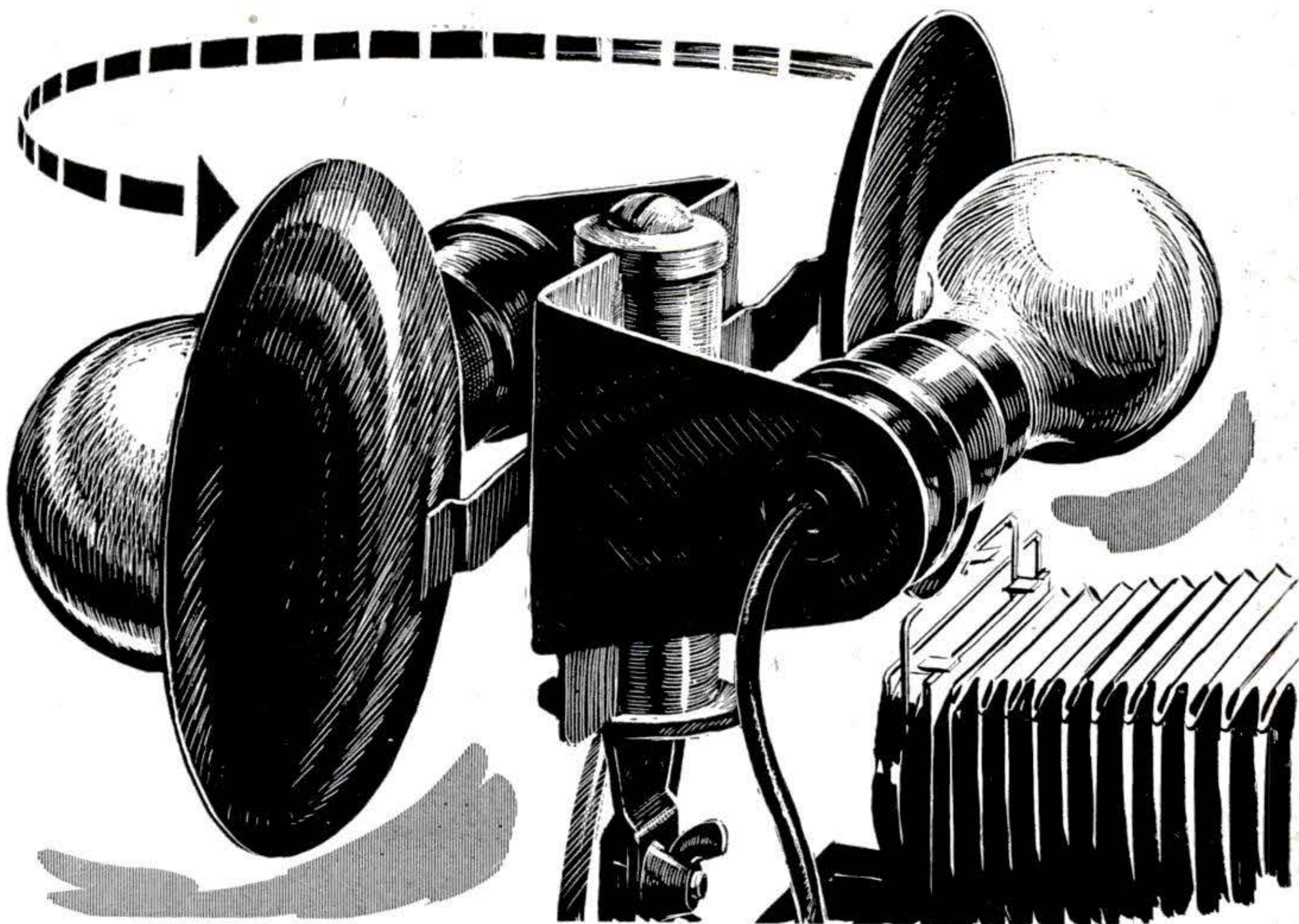
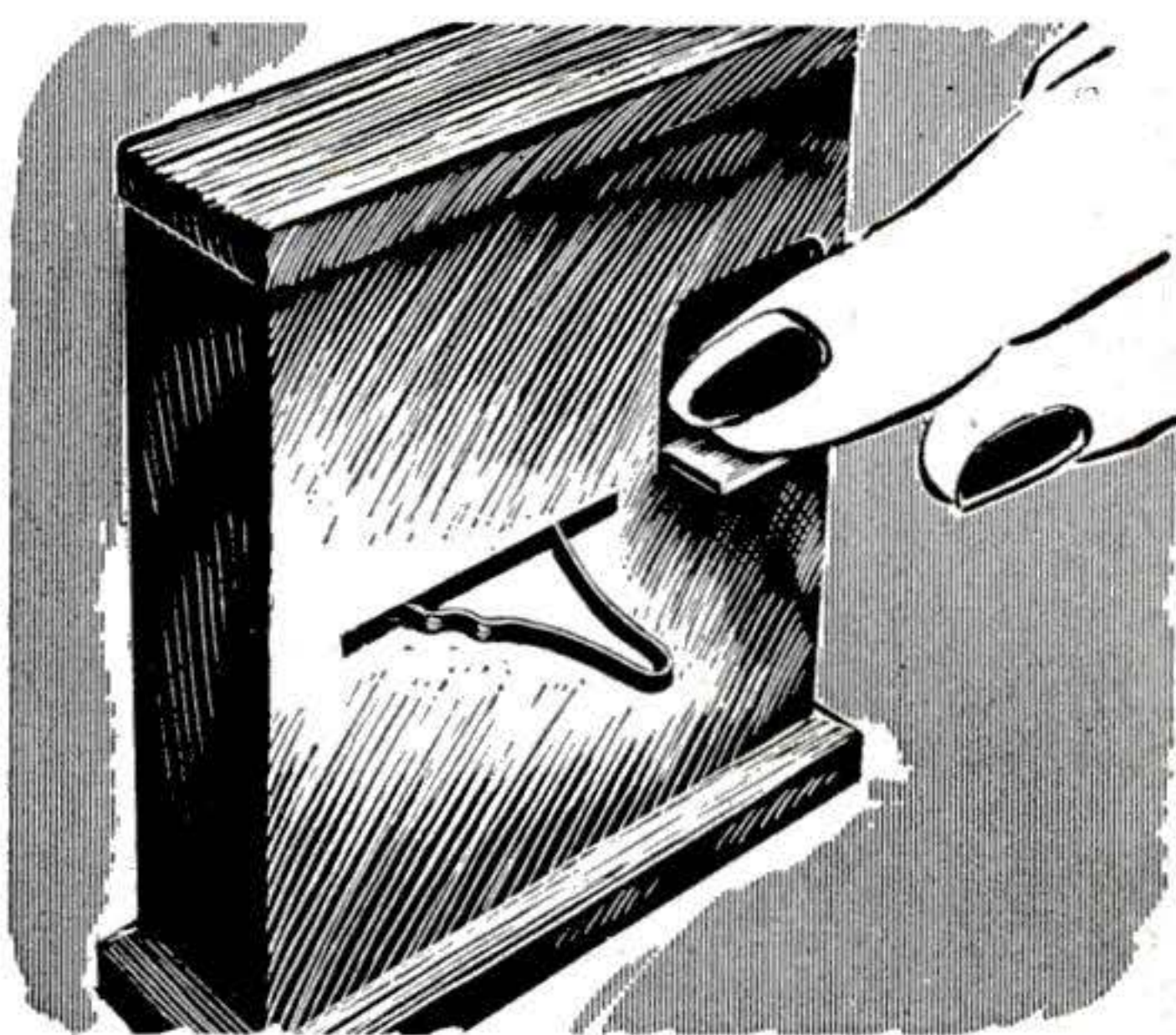


Photo Aid Aims Flash. A photographer wouldn't have to guess where his flash will hit with this double-headed light assembly. He could test direction and coverage with an ordinary bulb in one reflector,

then simply rotate the second reflector—which holds a flash bulb—until it locked in the same position. Invented by R. McMath, of Pontiac, and S. Menzel, of Detroit, Mich., the device tilts to any angle.



Shoulder Trigger Fires Gun. No need to fumble for the trigger when firing this gun—just pull it back against your shoulder. Invented by E. Zryd, of Beloit, Ohio, it has a spring-seated butt plate connected to the trigger by a rod running through the stock. When pushed in, the plate trips the trigger, firing the gun.



Dispenser Spreads Bobby Pins. Fewer chipped teeth for bobby-pin users is the object of this spreader patented by R. Sharp, of Carville, La. It holds a stack of bobby pins on an upright blade. Pushing down on a handle twists one bobby pin at a time against the blade, spreading it apart and pushing it out through a slot in the side.

Controlling Atomic

VISIBLE SMOKE STREAM

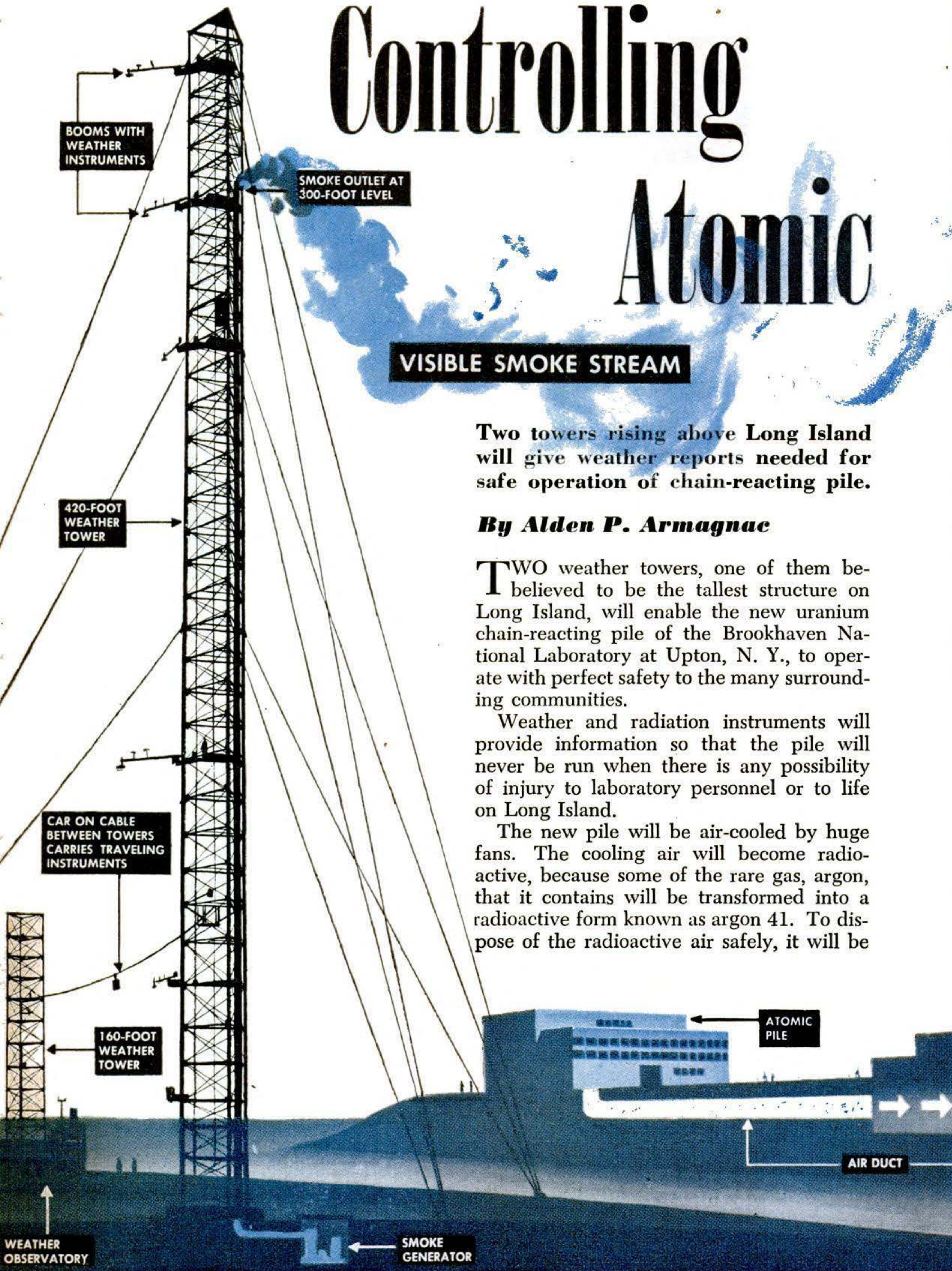
Two towers rising above Long Island will give weather reports needed for safe operation of chain-reacting pile.

By Alden P. Armagnac

TWO weather towers, one of them believed to be the tallest structure on Long Island, will enable the new uranium chain-reacting pile of the Brookhaven National Laboratory at Upton, N. Y., to operate with perfect safety to the many surrounding communities.

Weather and radiation instruments will provide information so that the pile will never be run when there is any possibility of injury to laboratory personnel or to life on Long Island.

The new pile will be air-cooled by huge fans. The cooling air will become radioactive, because some of the rare gas, argon, that it contains will be transformed into a radioactive form known as argon 41. To dispose of the radioactive air safely, it will be



Close-up of weather tower's smoke pipe shows one of two windows through which observer can see that smoke generator is operating properly. Outlet is at height of top of nearby air stack.



Gases

INVISIBLE STREAM OF RADIOACTIVE AIR

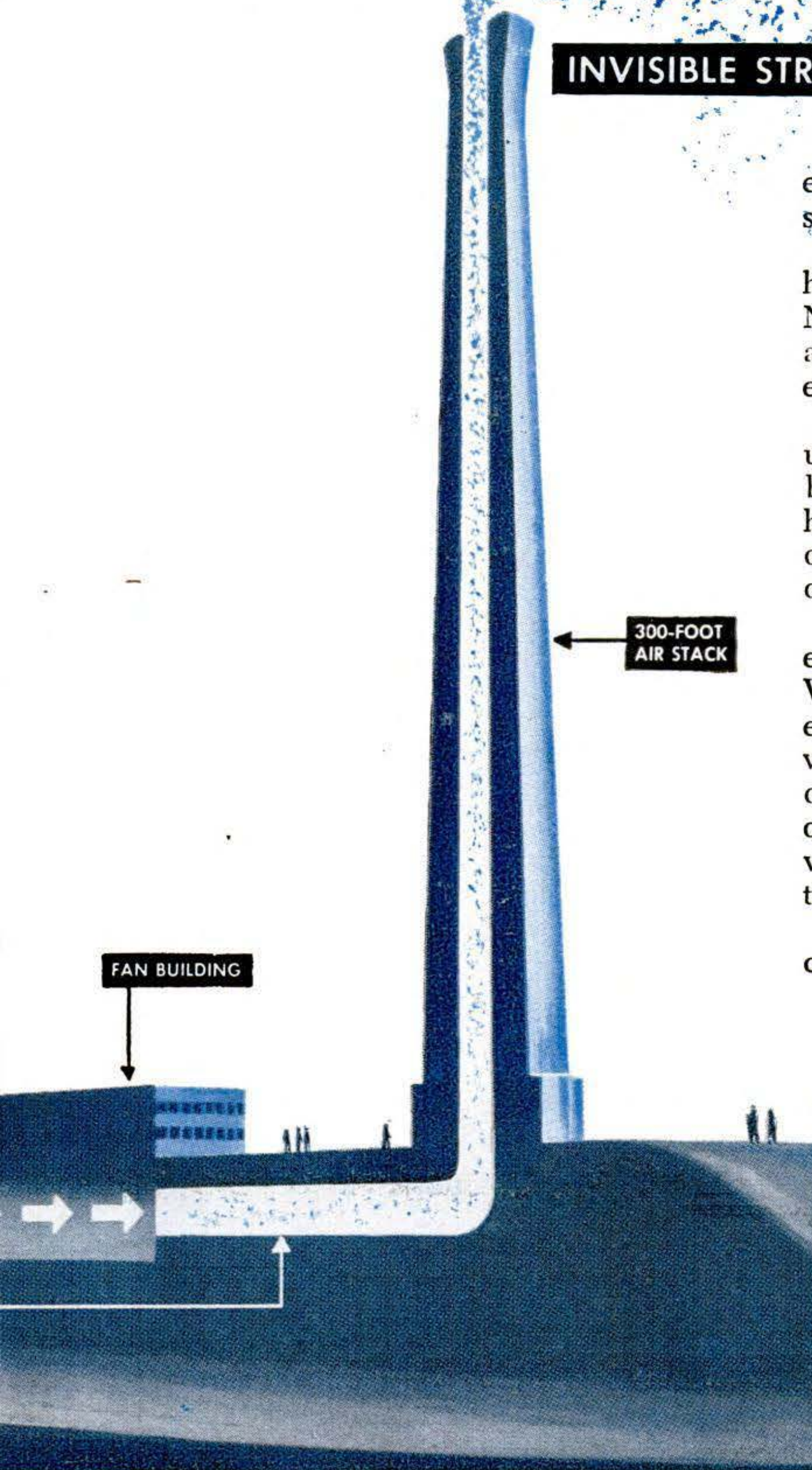
exhausted through a 300-foot stack, resembling a lighthouse, on a nearby hill.

The radioactivity lasts only a short time, half of it vanishing in less than two hours. Normally the air from the stack will rise, and so not drift back to earth before all effective radioactivity has disappeared.

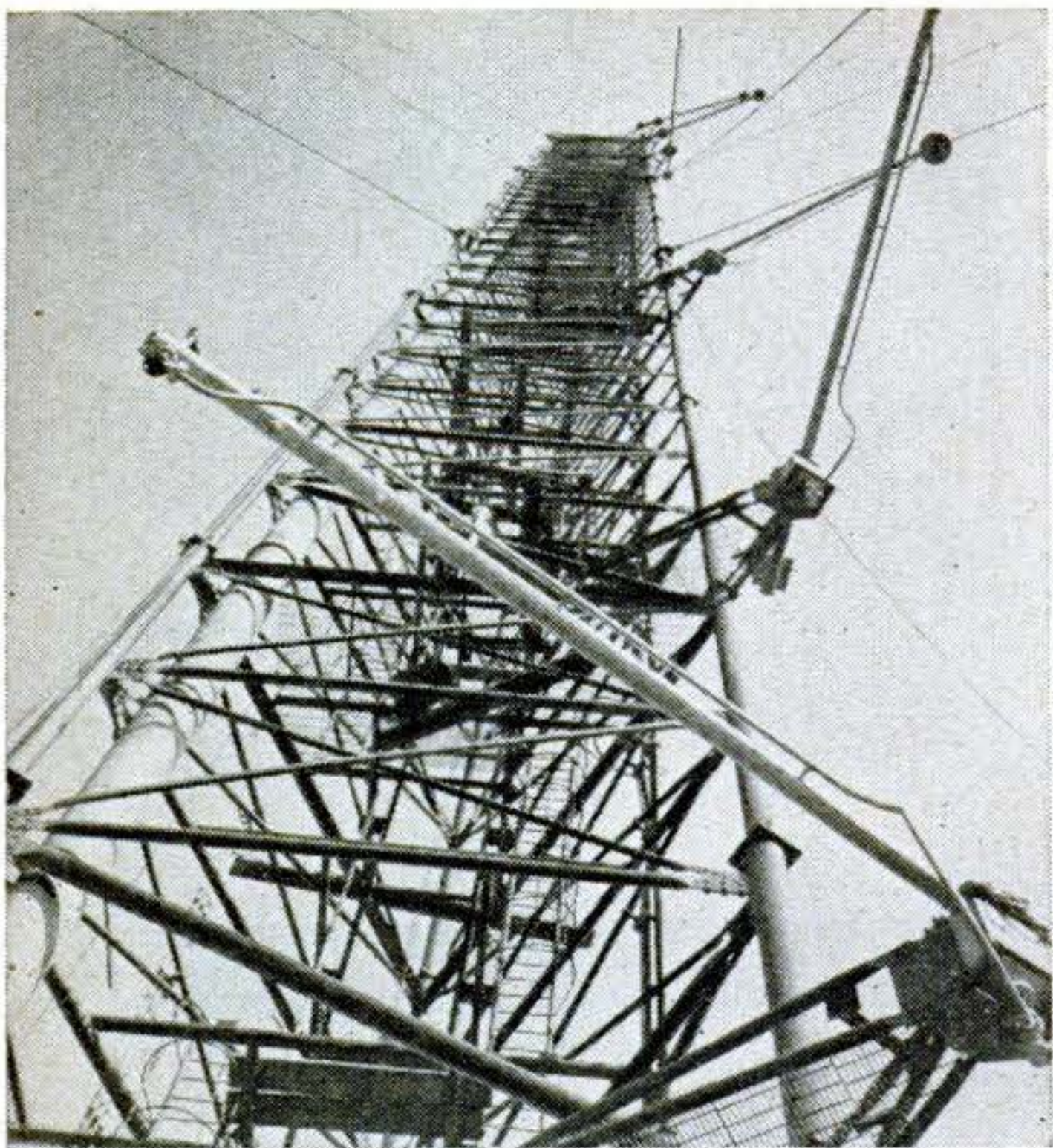
Design of the towers and operation of the unusual weather service has been worked out by the Brookhaven Meteorological Group, headed by Norman R. Beers. Each tower is of triangular shape; they reach to heights of 420 feet and 160 feet respectively.

On the taller tower, a smoke pipe rises exactly to the level of the nearby air stack. White smoke from an Army M-1 smoke generator, in a pit near the base of the tower, will frequently be discharged from the lofty outlet of this pipe. By watching the drift of the smoke, observers can see just what will be happening to the invisible gases from the air stack.

At various levels on each tower, booms carrying remote-indicating weather instru-



Smoke plume from Brookhaven weather tower gives observers a visible check that radioactive air from atomic pile is borne away at safe distance from earth. Operators will run pile only when air from stack will not settle on or near the ground, as shown by weather and radiation instruments under constant observation.



Skyward view of 420-foot weather tower under construction shows adjustable booms for weather instruments at various levels. Instruments had not been installed when photo was made.



Typical weather instruments on this boom include, left to right, wind vane, anemometer, combination wind speed and direction indicator, and, below it, electrical thermometer.

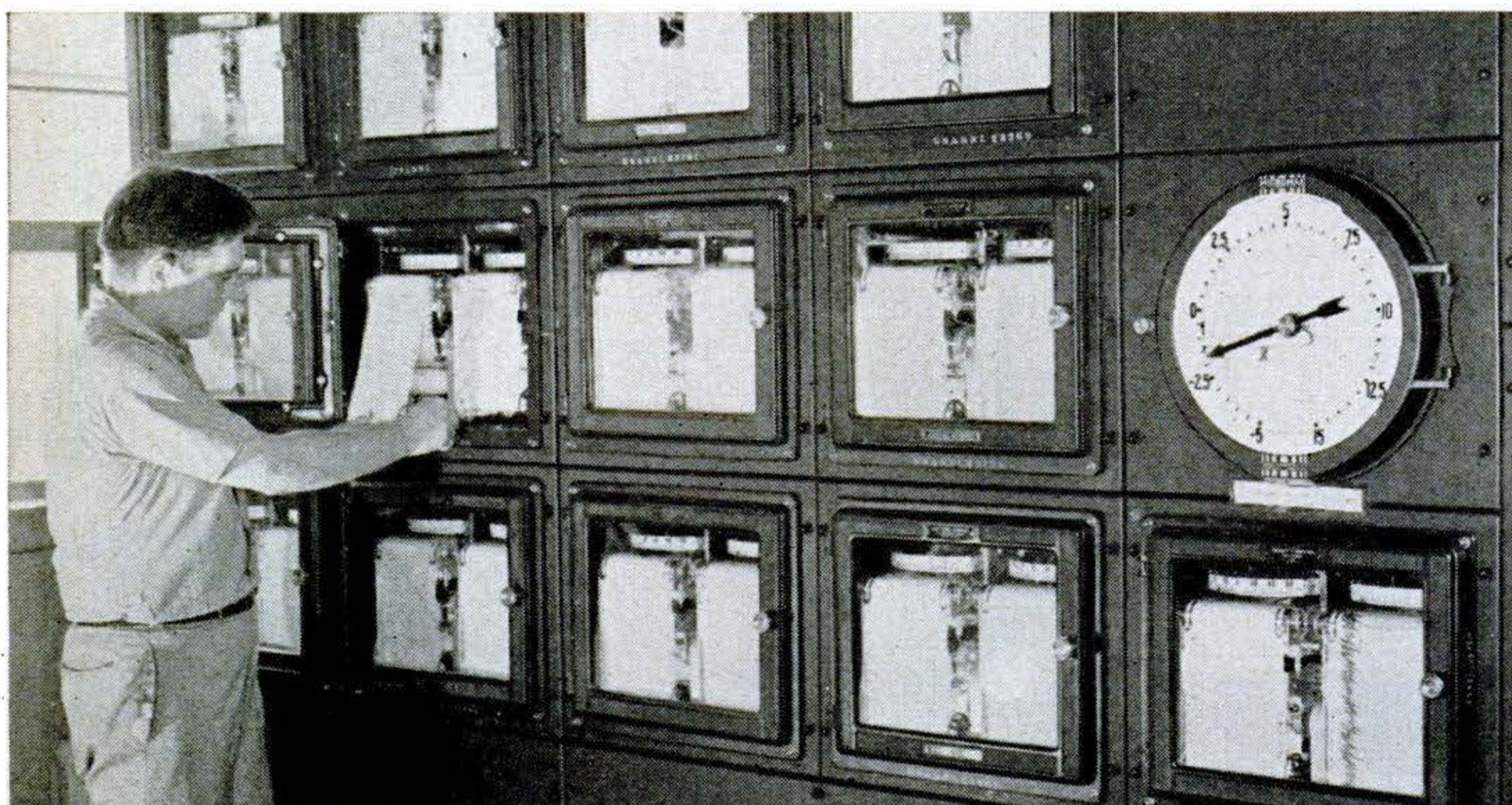
ments may be swung out by hand wheels to any desired angle so that the tower structures will not affect their readings.

On a cable stretched at about 100-foot height between the two towers, additional instruments will ride on a self-propelled electric carriage. These will register variations in air conditions along a horizontal line, just as the instruments on the tower

booms show variations with height.

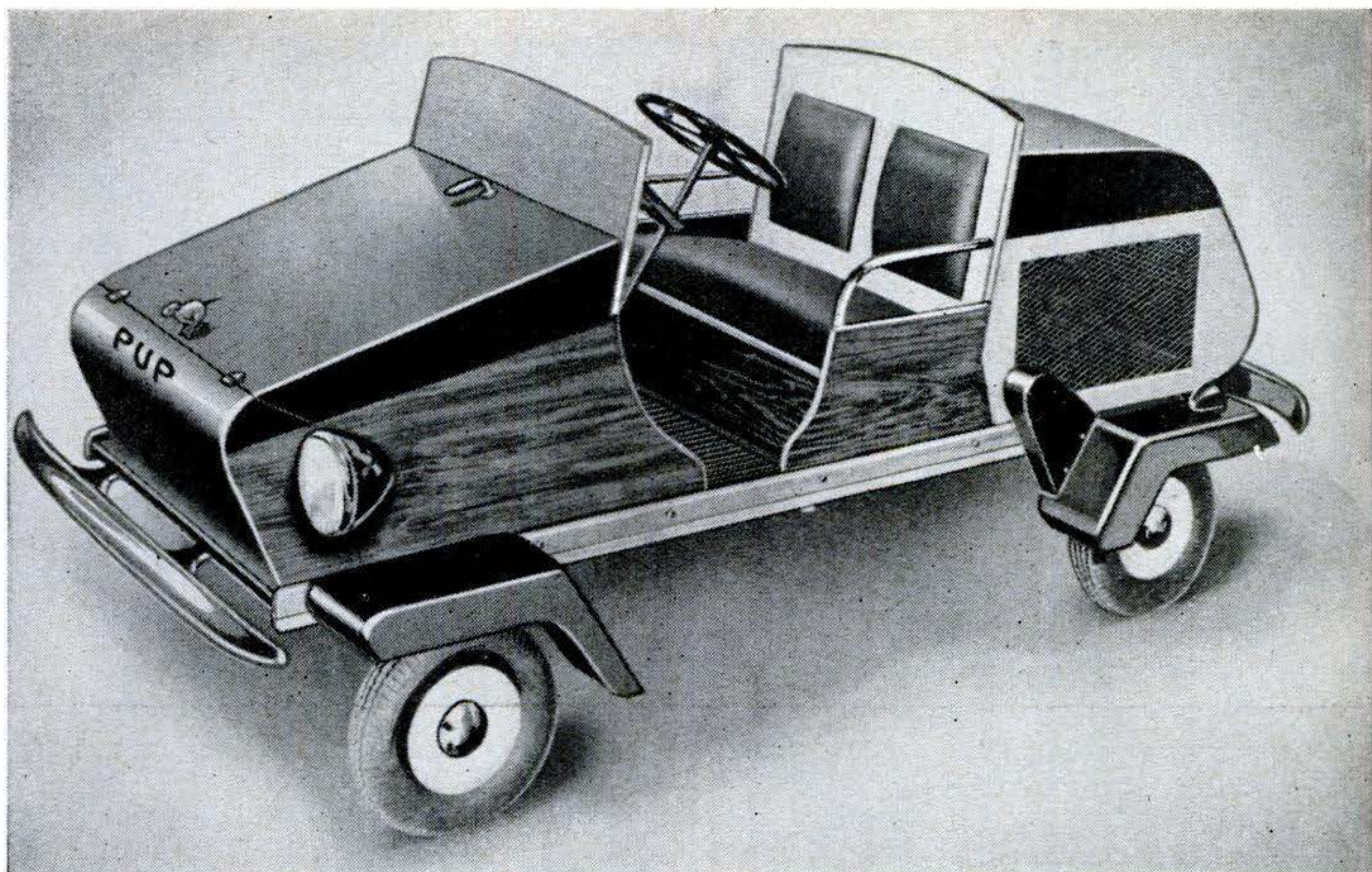
For access to the equipment aloft, an elevator in each tower will carry scientists up and down. This will seldom be necessary, however, since all instrument readings are continuously registered on a central panel in an observatory building several hundred feet distant. There observers will watch them 24 hours a day.

END



Central panel in weather observatory enables observers to watch the readings of all the instruments on both towers. Charts show wind speed and direction and air temperature at all

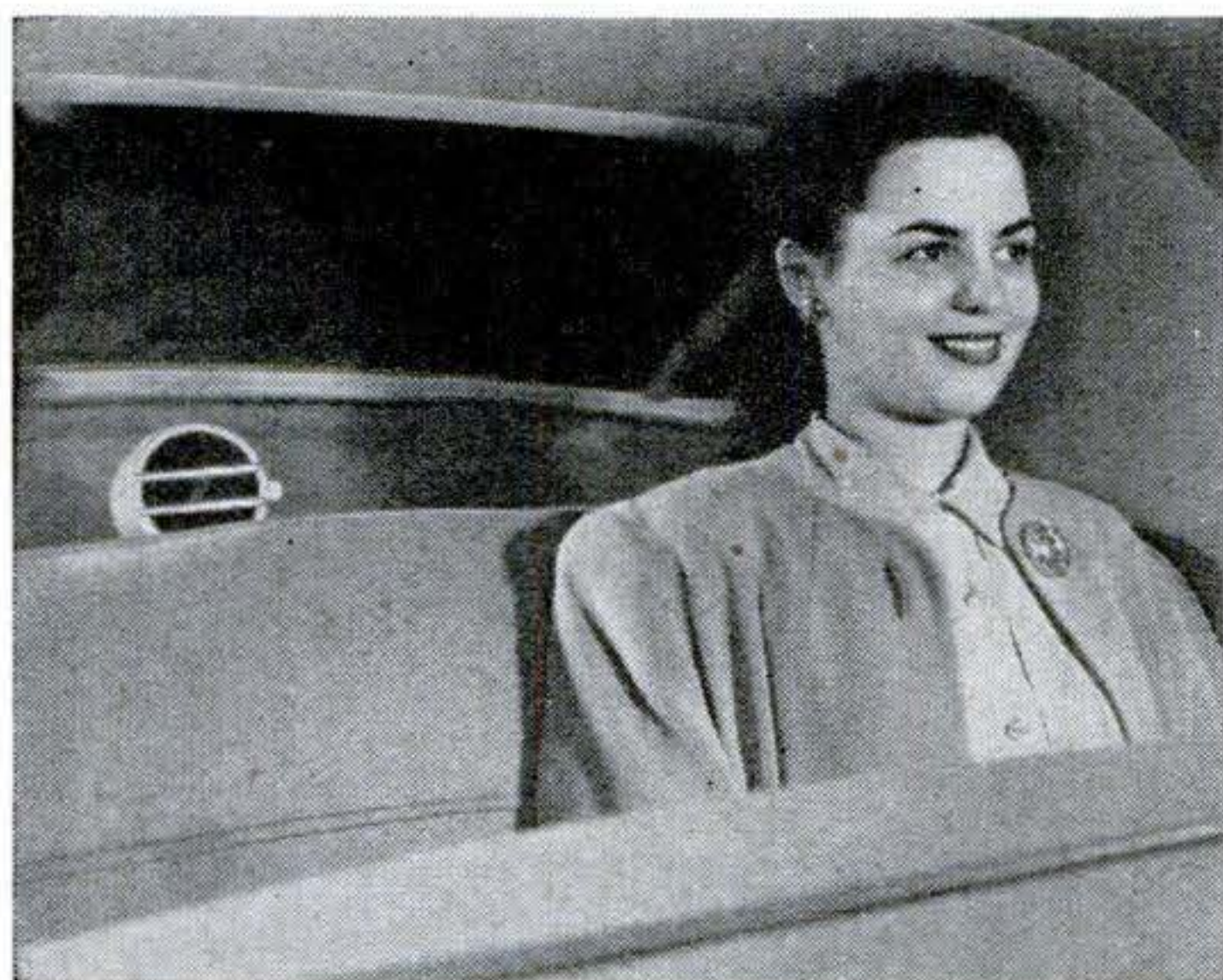
levels. Clocklike instrument at right is a temperature-difference indicator showing directly the variation with height. Observers on duty day and night safeguard operation of the pile.



New Car Weighs 600 lb.

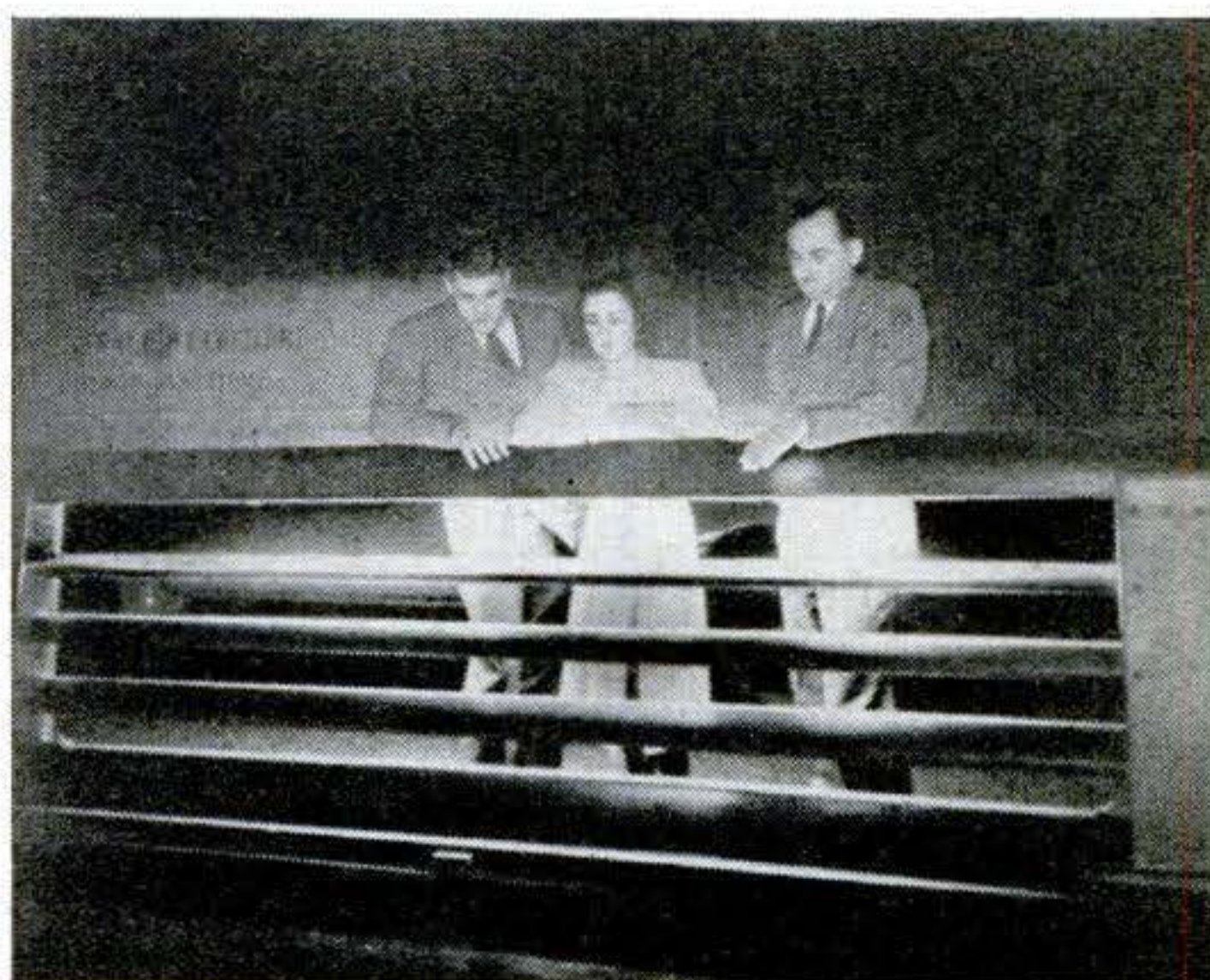
LATEST entry among the flyweights, the 600-lb., two-passenger auto above claims up to 60 miles to the gallon. Its engine—either a 7½-hp., one-cylinder job or a 10-

hp., two-cylinder one—is in the rear, with luggage space in front. An automatic clutch is standard. Made by Pup Motor Car Co., of Spender, Wis., the car is 8½ ft. long on a 6-ft. wheelbase. List prices are reported as \$500 to \$600 f.o.b.



Radio Piped to Back Seat

DRIVERS of Ford-made automobiles can now distract their back-seat drivers with sweet music. Fords, Lincolns, and Mercurys from 1946 to 1949 can be equipped with a back-seat speaker that feeds the radio right into passengers' ears. It also keeps high frequencies usually lost in car noise. About the size of an alarm clock, the new speaker has a spring clip and a 20-ft. cord, so that it can be taken out and set up at a distance.



Guard Rail Lights Road

THESE guard rails do a double job. Besides keeping unwary tourists from plunging over the edge of Shasta and Grand Coulee Dams, they light their path by night. Fluorescent lamps 6 to 8 ft. long are being installed under the semi-circular top rail of glistening steel, and their light will blanket the entire roadway without glare. General Electric prepared the lighting setup for the Bureau of Reclamation.

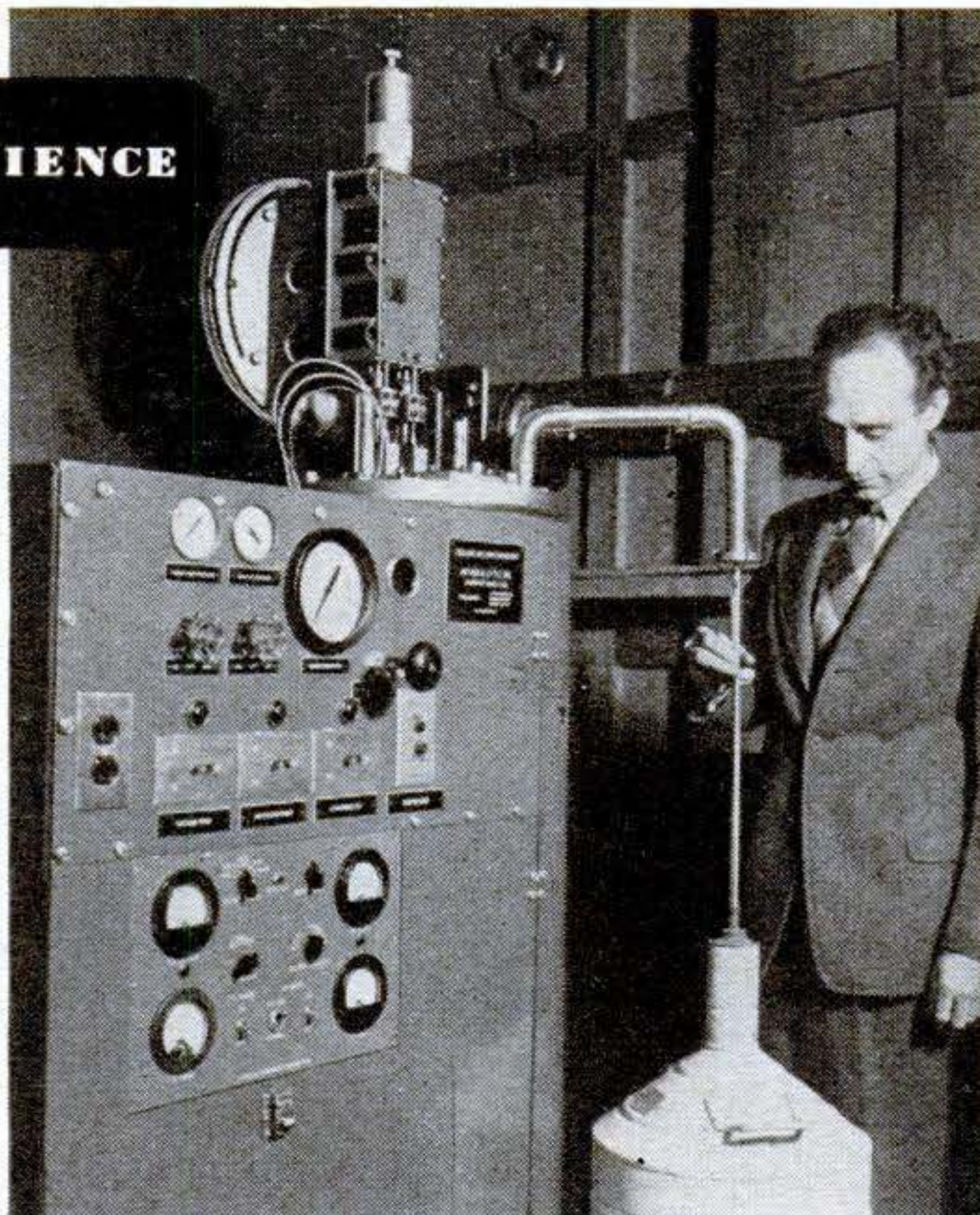
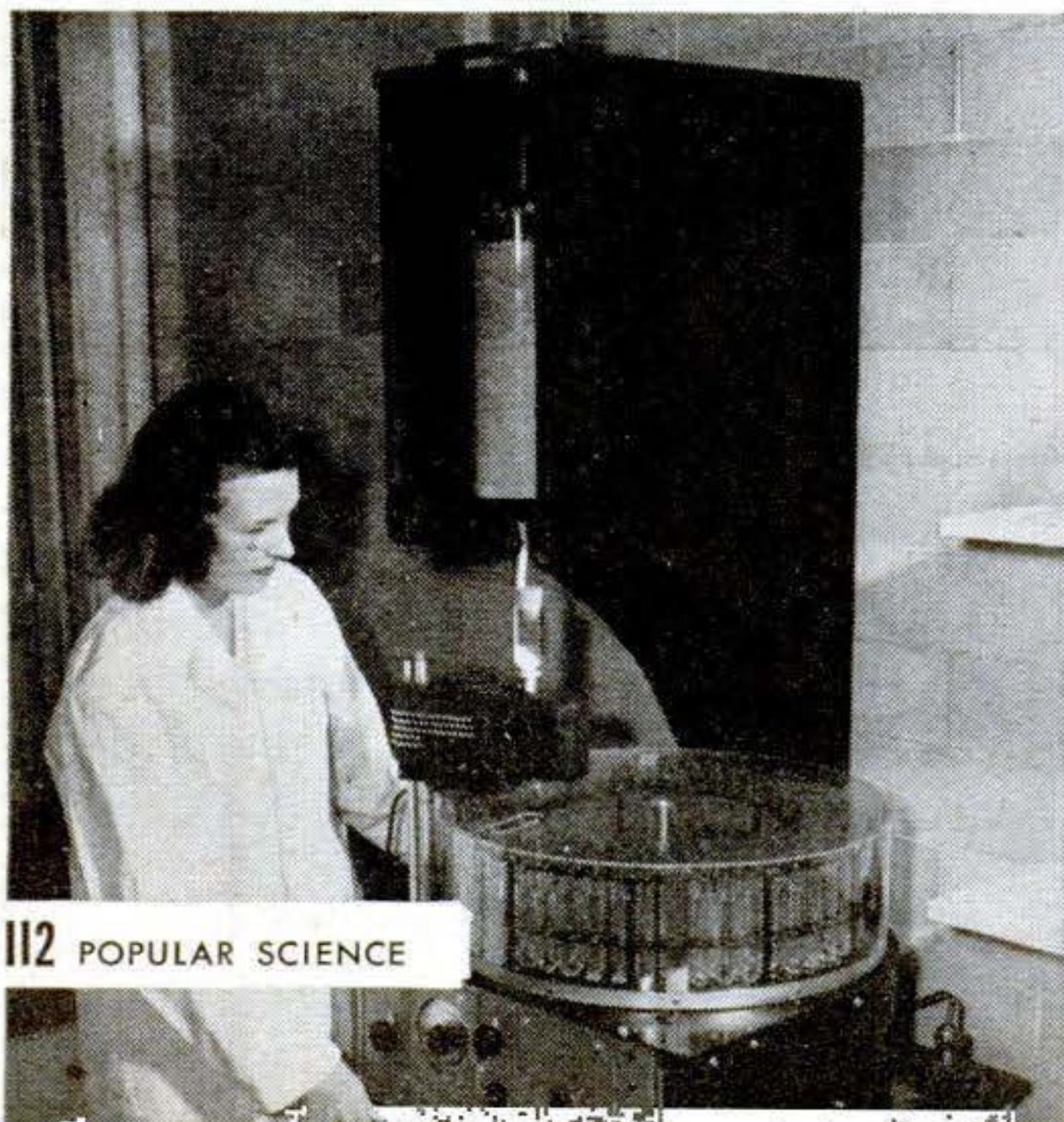


MARCH OF SCIENCE



Light, Air Bake Enamel. Both infra-red rays and hot air are used to bake the enamel finish on metal parts in General Electric's new test oven. The combination is expected to produce better finishes, since some enamels require the quick heating of the infra-red lamps at the start, followed by the lower, even temperature that the hot-air units can provide. The hot air is blown in, while 288 lamps inside give the radiant heat.

Separator Counts Drops. A machine that automatically separates individual compounds from mixtures of biological solutions, counting each drop with a photoelectric cell, is speeding the search for new medicines at Sharp and Dohme research laboratories. Shown below, it makes use of the fact that some compounds stick better to "adsorbing" surfaces than others.

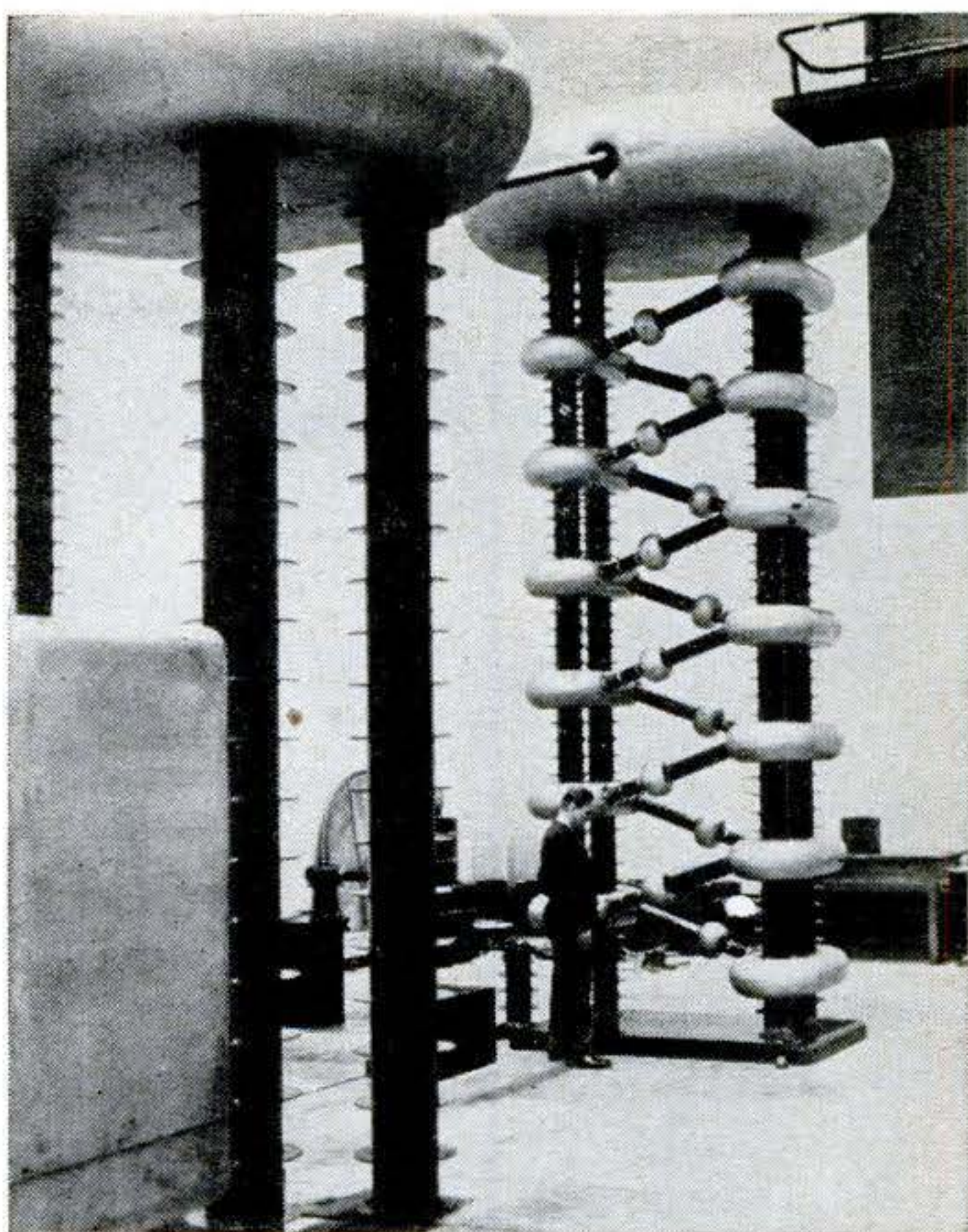


Cryostat Freezes Helium. This super-refrigerator turns out liquid helium—at about -452°F. —as easily as your kitchen box turns out ice cubes. It now is aiding research near absolute zero (PS, Aug. '47, p. 77). Until development of this cryostat—apparatus for maintaining low temperatures—by Arthur D. Little, Inc., and Dr. S. C. Collins of MIT, liquefying helium required a laboratory full of expensive equipment.

Early Indian Unearthed. This Indian (below) had slept peacefully for 15 centuries—until Wisconsin citizens decided to build a road over his grave. A crew working near Madison unearthed the skeleton. It was identified as belonging to the Hopewell culture, a civilization that flourished around 500 A.D., by Dr. Andrew Whiteford (center), anthropologist of Beloit College.

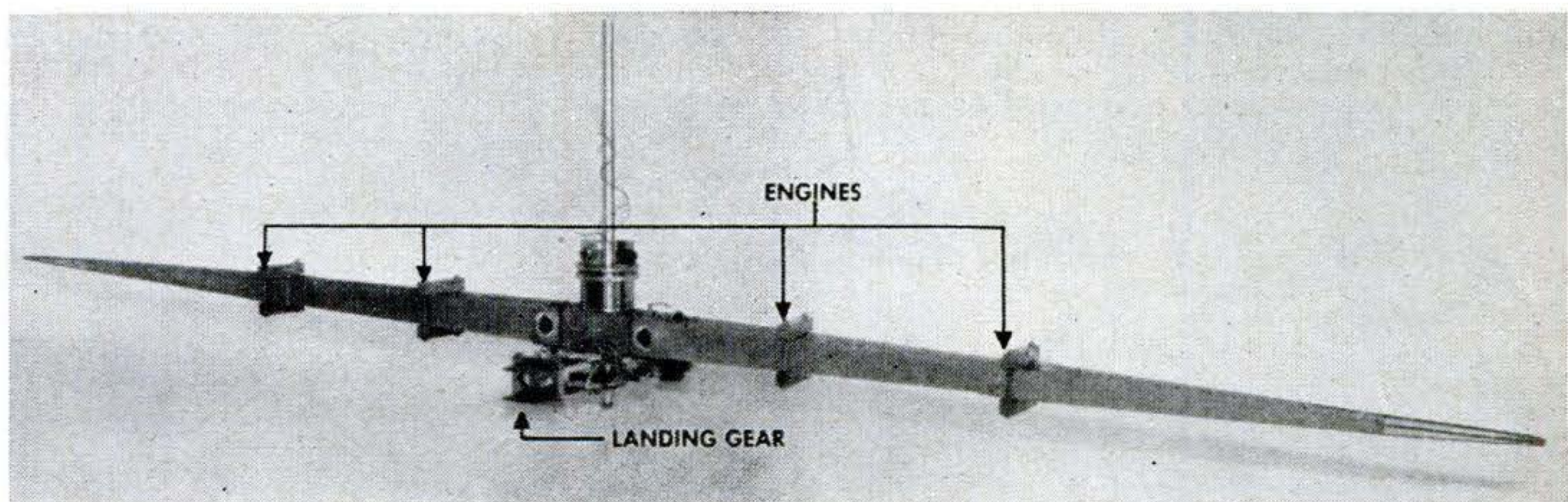
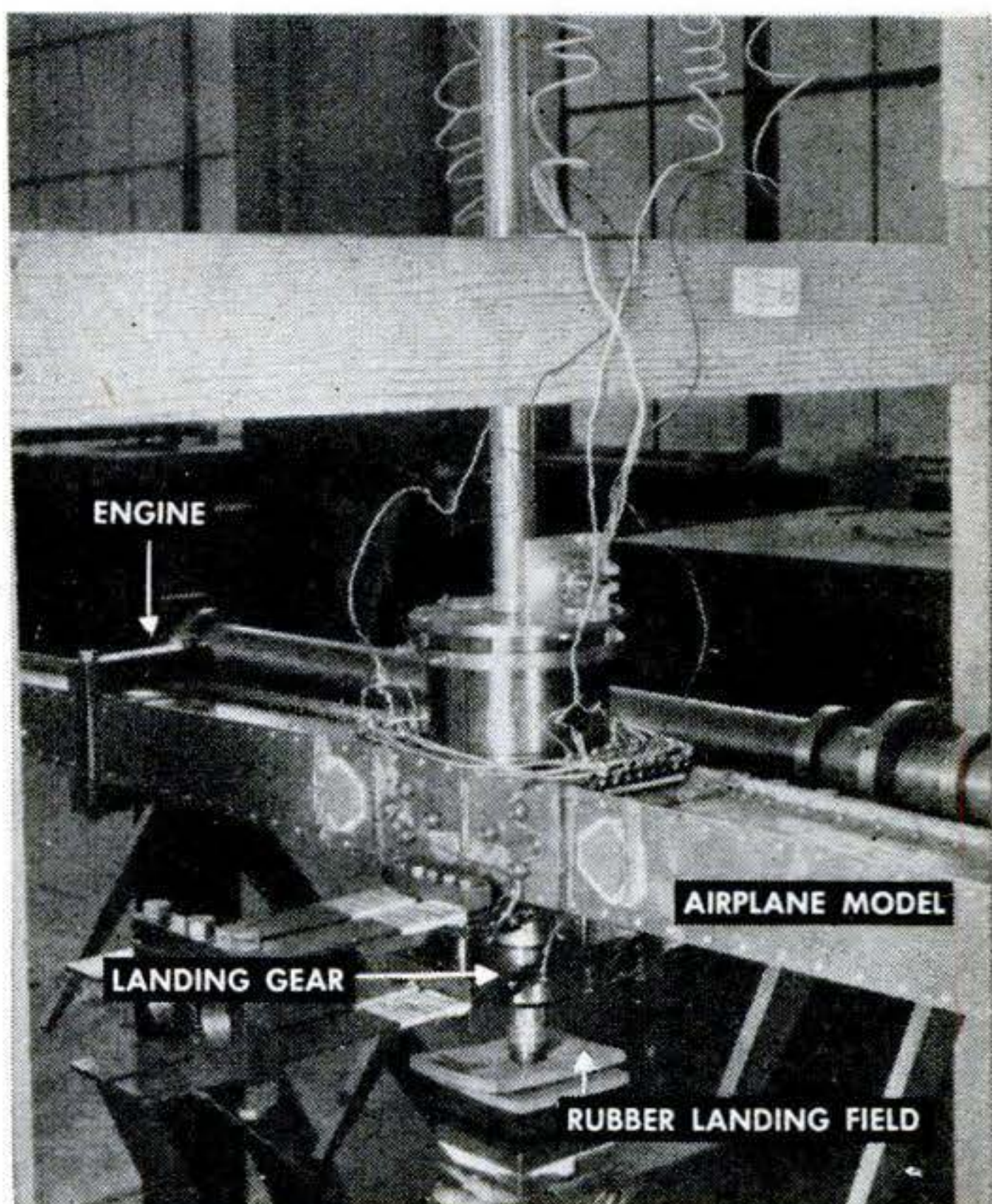


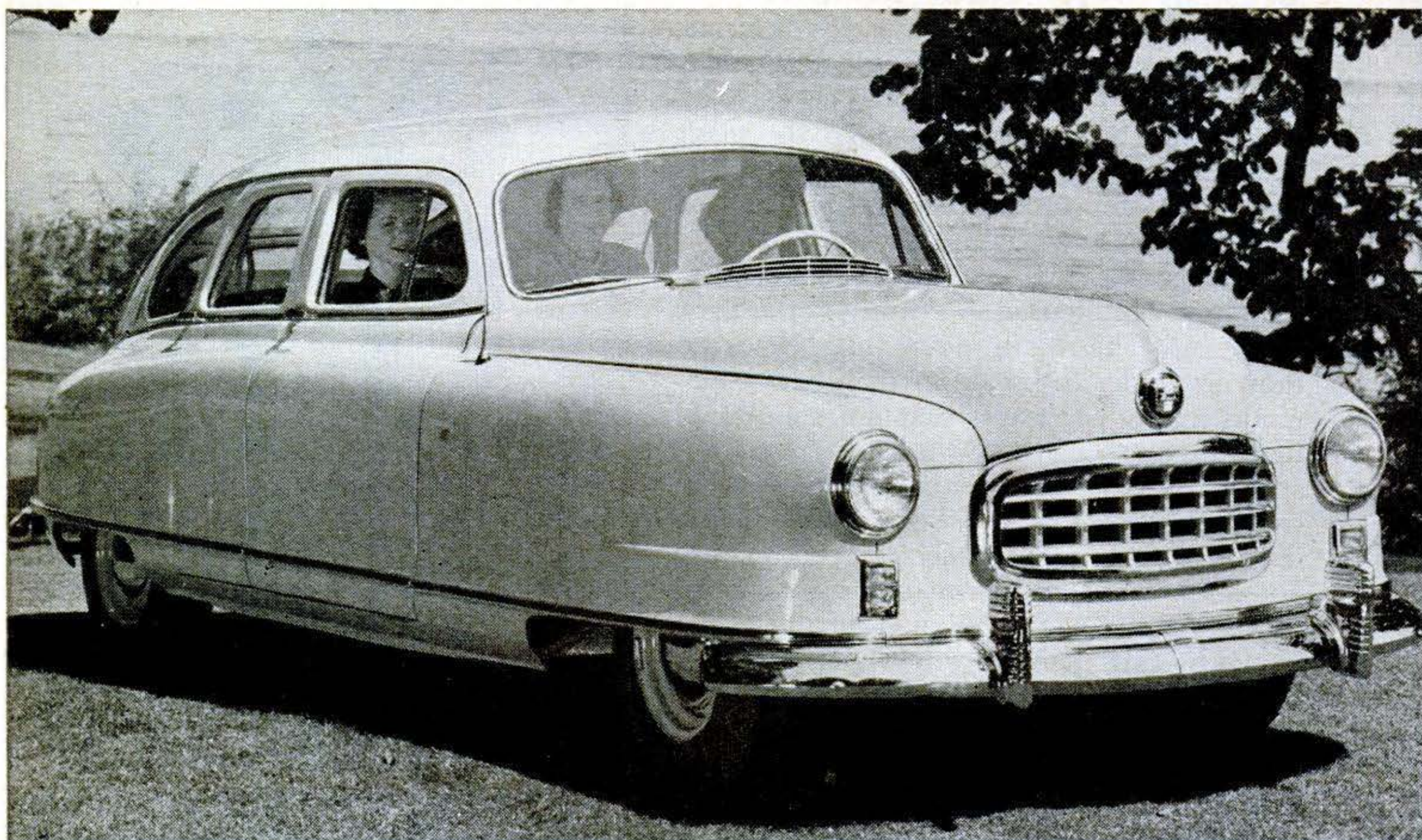
Britain Gets Atom Buster. Able to fire nuclear particles at energies of a million electron volts, Britain's latest atom smasher is shown at right being checked by an engineer who helped to build the giant machine for the Clarendon Laboratory, in Oxford. A step in the expansion of nuclear research sponsored by the government's Department of Scientific and Industrial Research, it will be used in a study of the light elements. These are being used because they are easier to break up than heavy elements and give results that are simpler to understand. The new atom smasher will speed protons or deuterons—the central cores, or nuclei, of hydrogen or heavy hydrogen—to the million-electron-volt energy and then let them fly at the target atoms. Studies of the pieces chipped off the target nuclei by this attack give information useful in many applications of nucleonics.



Model Plane Lands in Lab. An airplane model that doesn't look at all like an airplane is helping U. S. Bureau of Standards engineers figure out how to design real planes that won't shake apart from the vibration caused by landings. The model (below) is a long, tapered box beam made of aluminum sheet. Its dimensions are such that its weight distribution and flexibility are proportional to those of a big transport. It has weights placed to play the part of engines, and an imitation landing gear.

In the test (right), the model is dropped on a rubber "landing field"—the rubber simulates the flexibility of the tires—and the forces and twists caused by the impact are measured with electrical instruments. These are then compared with the results predicted by theoretical calculations. In that way the theory can be corrected so that designers are able to forecast how badly a big airplane will shake when landing.





Fenders enclose front as well as rear wheels of 1949 Nash. Elimination of cutouts formerly

needed to let them pivot on turns is made possible by setting them well inside fender line.

New Nash Swallows Its Wheels

By R. P. Stevenson

Bed is made by swinging down back cushions of front seats, as shown at left below. Stops pull out from rear-seat cushions as supports. Accessory mattress then is laid on the three

IT WAS only a matter of time until one of the established automobile makers put skirts on its cars' front wheels to match those on the rear. The 1949 Nash has them.

The first reactions of the car-hungry public to the new Nash models were:

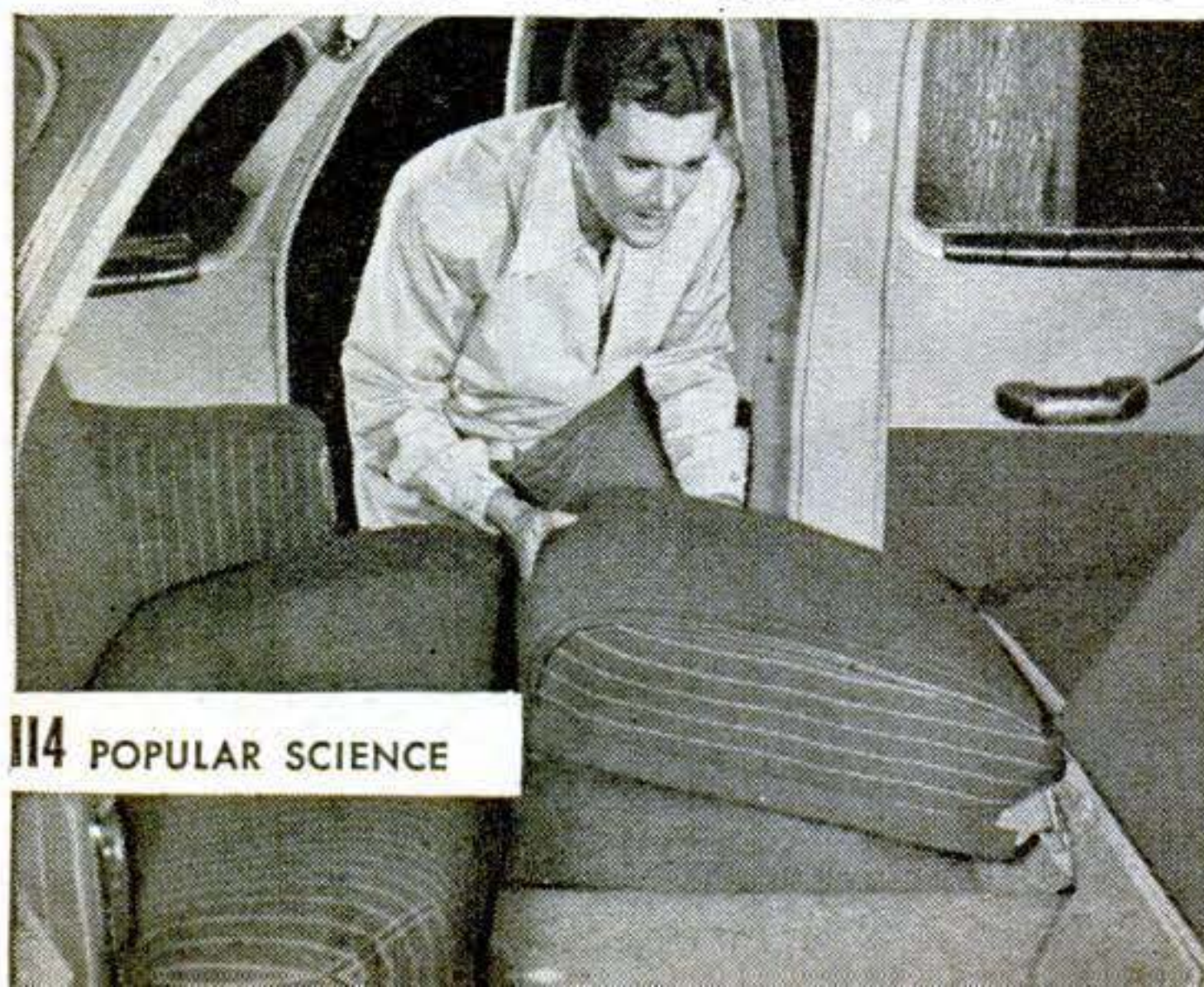
But how do you turn a corner?

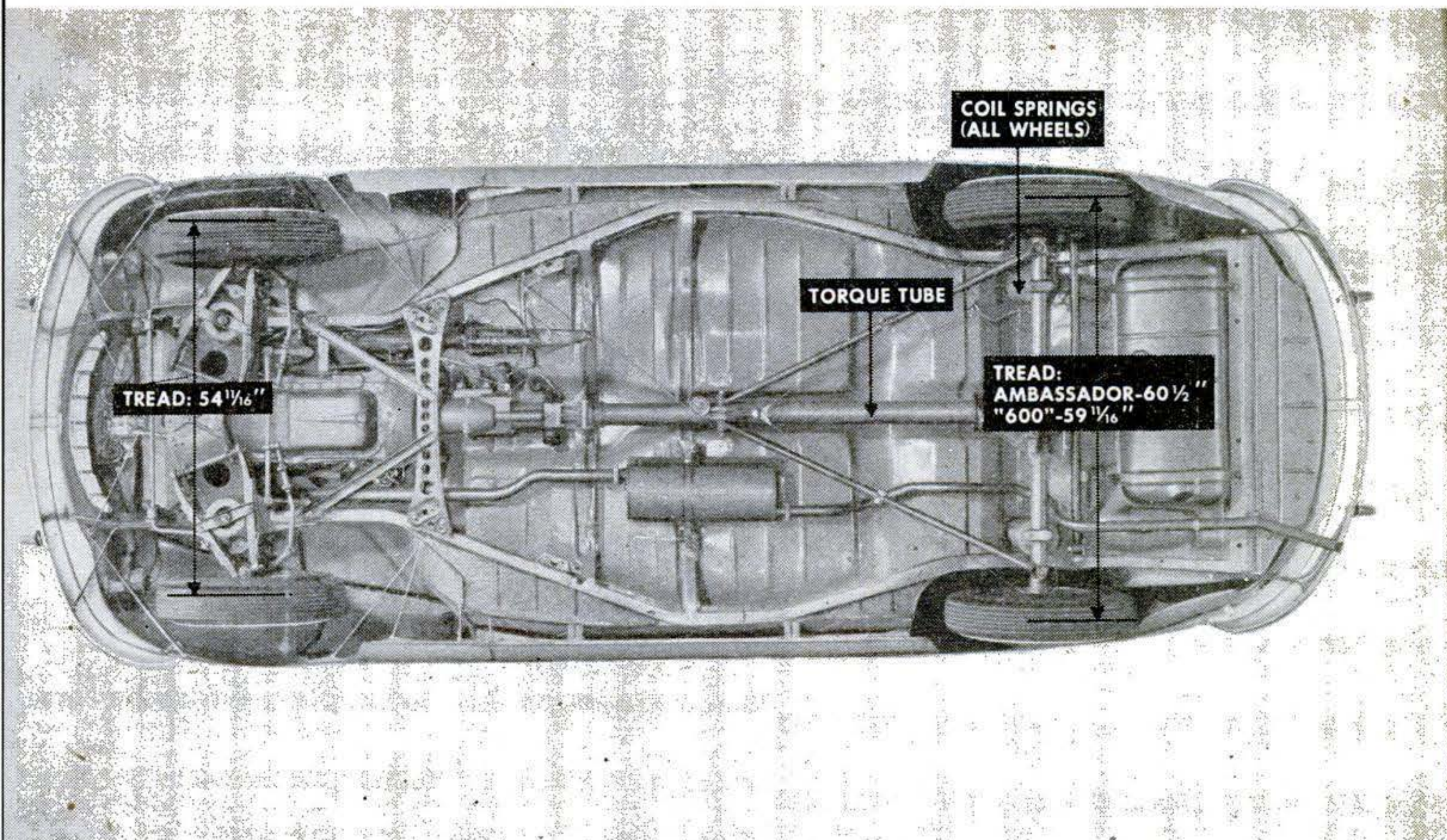
How do you change a wheel?

For the designers' neat solutions to both problems, see the accompanying photographs.

While the pontoon-type front fenders are the most obvious departure from previous designs, Nash—like most of the manufacturers making their first real bids for post-

cushions, as at right below. Single bed uses only right half of split front seat. Two-door sedans come with bed-type front seats; buyers of four-doors must specify bed equipment.





View from underneath shows front wheels set about 5 in. closer together than rear wheels to

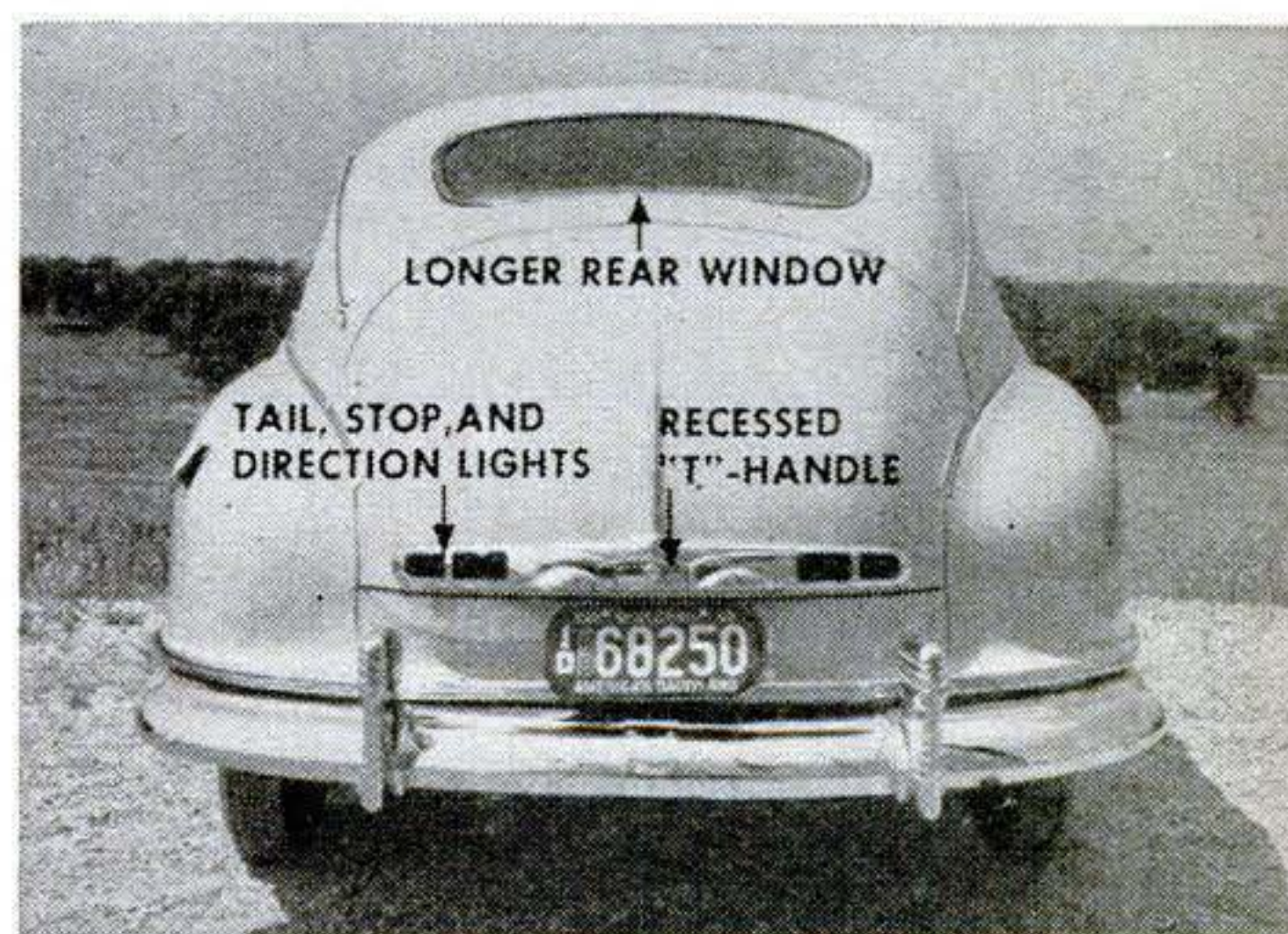
permit enclosed-wheel design. Company says this doesn't materially affect car's stability.

war business—has gone whole hog on its 1949 Airflyte[®] models. They are the fancy-pants Ambassador, with 112 horsepower; and the 600 model, with 82 hp.

The silhouettes of both are lower than those of former years. Roofs have been dropped from 68 to 62 inches without reducing road clearance or interior headroom. "Lounge interiors," contributing to the trend toward regarding the family automobile as an extra room for the home, are 9 ft. 4 in. long. The front seat is 5 ft. 3 in. wide; the rear, 5 ft. 1 in.

Again this year, Nash is emphasizing its automobile "bedroom." Drop the back of the right front seat, spread a mattress, and you've got a full-length single bed that can be occupied while the wheels eat up the highway. Drop the backs of both front seats and you have a full-size bed for an overnight stop. Unlike previous Nash models, the '49s have beds that can be made up without lowering the back of the rear seat or digging into the luggage compartment.

Standard equipment on both cars includes the new low-pressure tires. An improved version of the Nash-originated Weather Eye[®] air-conditioning system provides a complete change of air every two or three minutes with the windows closed.



Bluntly rounded tail of new Nash has stop and direction-signal lights mounted on lower edge of trunk lid. Inside, at left, is red light visible to approaching drivers when the lid is up.



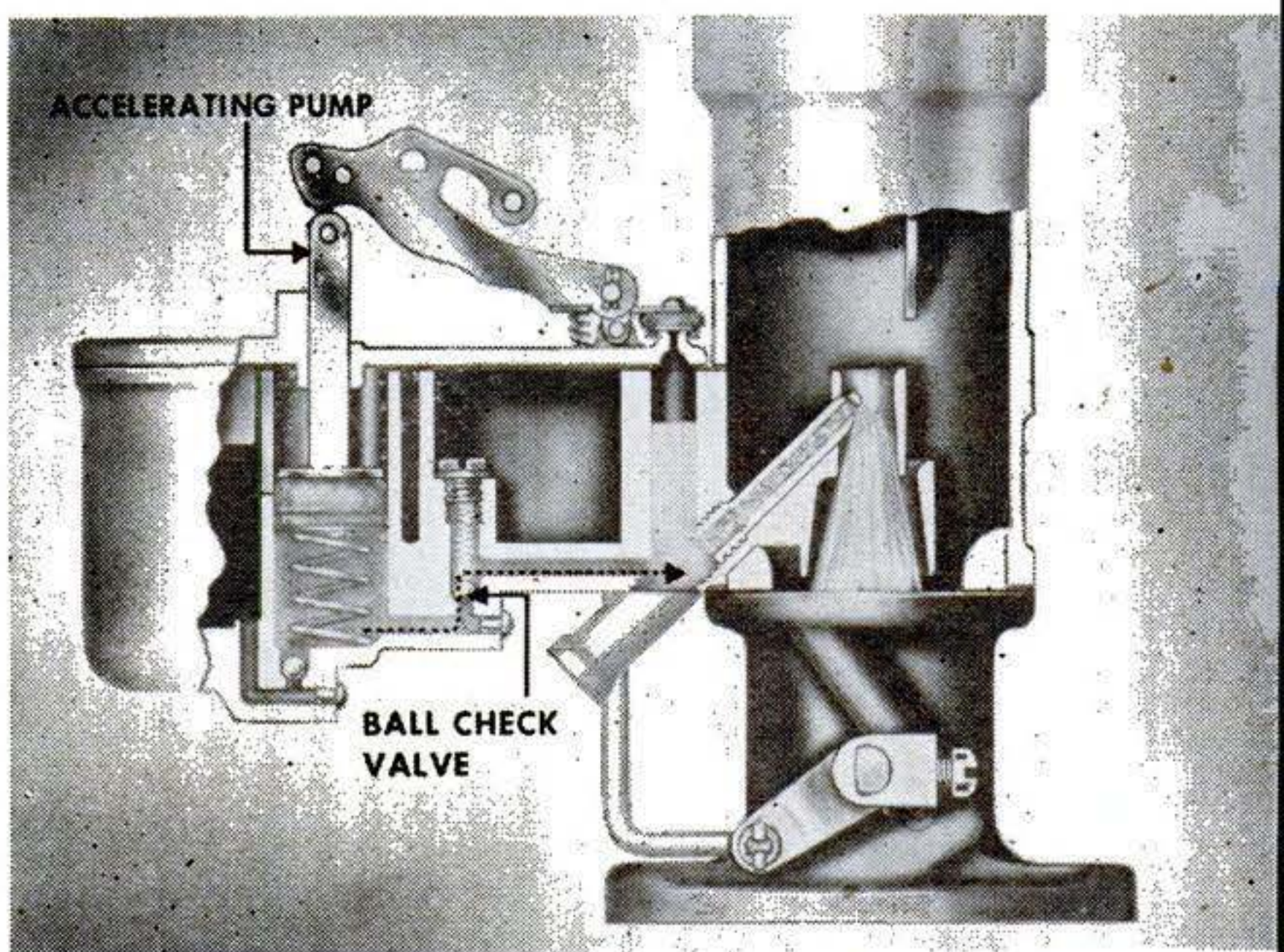
Removing a front wheel is no more of a job on the 1949 Nash than taking off a skirted rear wheel. Lower edge of the fender is high enough for easy access to hub cap and wheel studs.



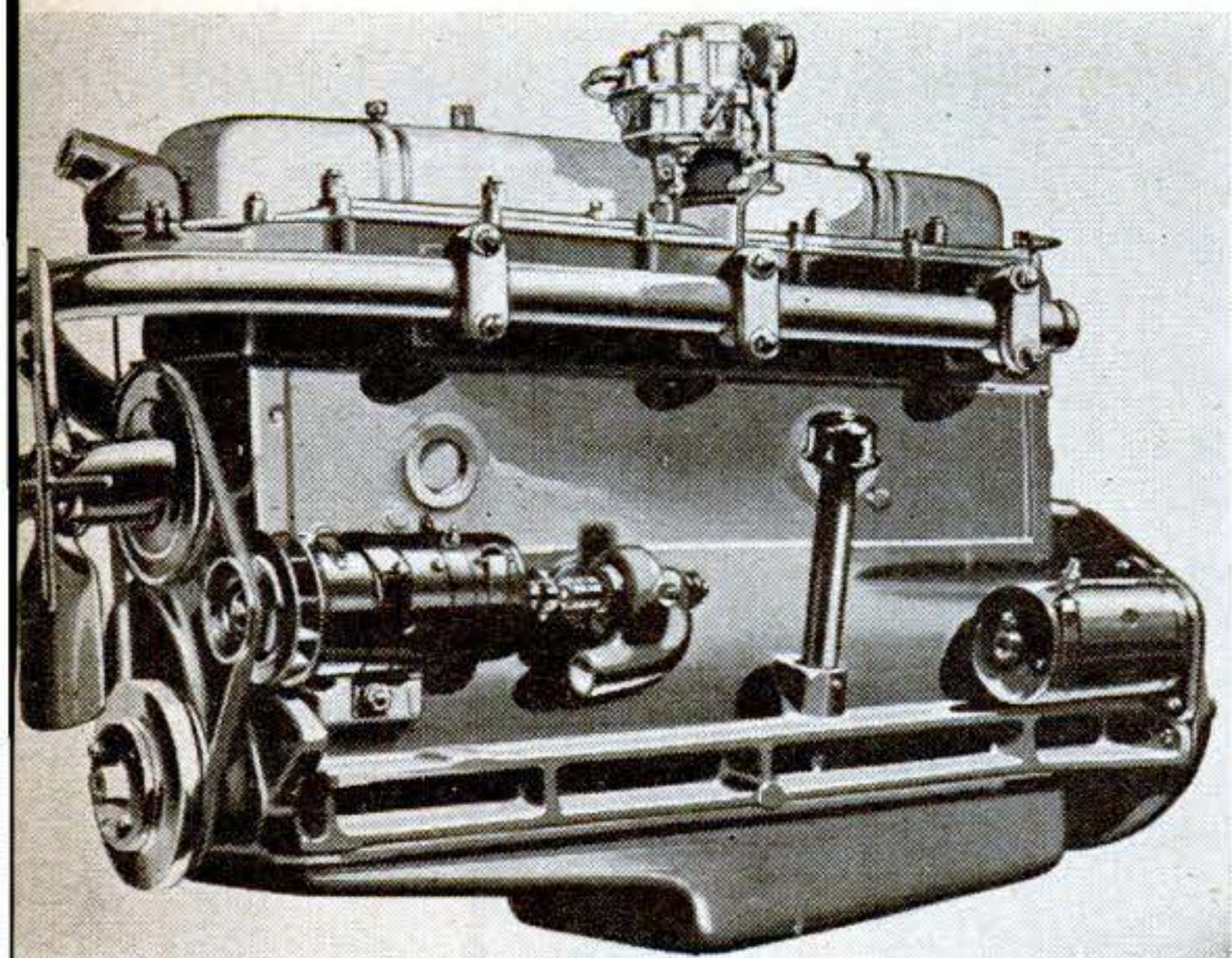
Nash's "unitized" construction, with frame and body welded into a single steel unit, is demonstrated in this view of simulated assembly line. Coil springs are used all around.



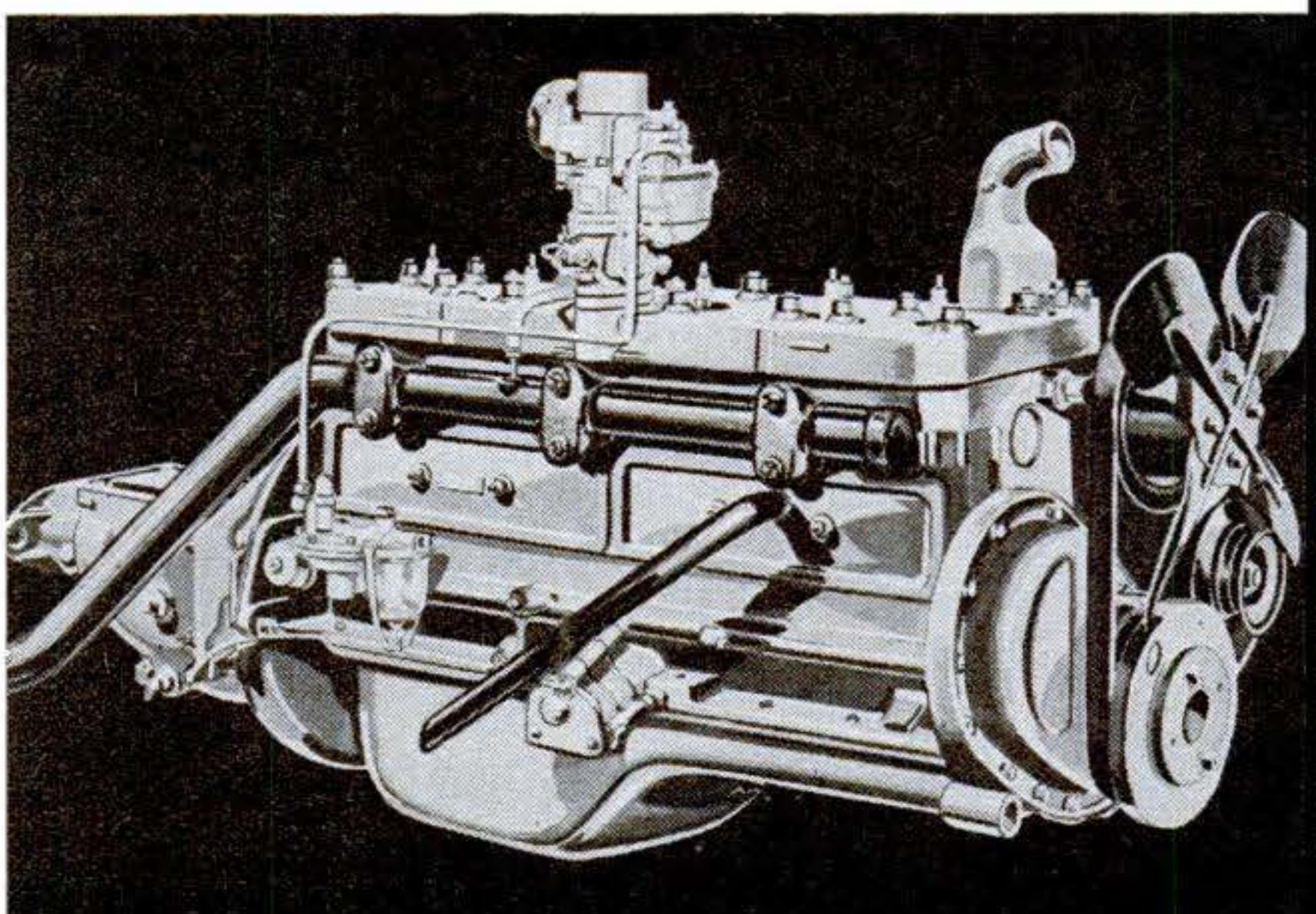
Unique in Nash is airplane-type container for instruments, called Uniscope®, mounted on steering column. Switch to control intensity of light is provided to reduce driver distraction.



New system of carburetion eliminates feeding engine an over-rich fuel mixture in acceleration. Accelerator pump discharges into passages between main jet and high-speed nozzle.



Ambassador model's crankshaft has seven bearings, adaptable to higher compressions. Cooling system has capsule of powder that expands with heat as its temperature-sensitive element.



Engine of 600 model has stiffer crankshaft than last year's. Increased counterweighting gives better balance, greater smoothness. Four-ring pistons reduce oil consumption and wear.



Hotel Gets 1-Piece Baths

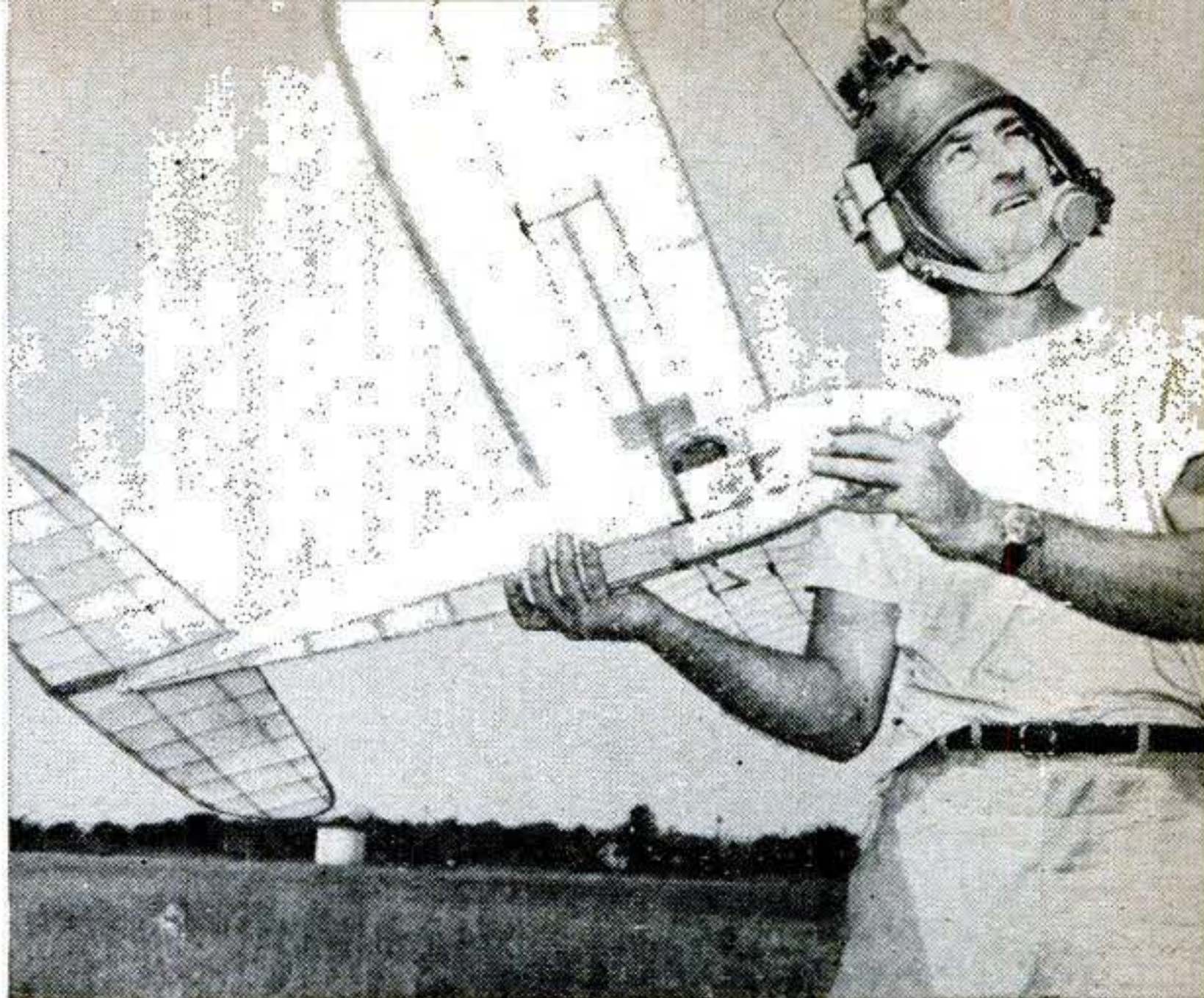
ONE of 1,100 prefabricated bathrooms is hoisted into place to speed construction of the Laurentien Hotel in Montreal. Factory-assembled of steel and plastic, with all fixtures installed, it's ready to be bolted down and connected to the plumbing.



New Yarn Outlasts Wool

HERE'S one rug no bug will be snug in. Woven from yarn made entirely of synthetic materials, it won't make a meal for even the most ravenous of moths. It won't bother persons who are allergic to wool, either.

Called Adoran®, the new yarn is a chemical composition produced by an electronic process. In abrasion tests, rugs made of the yarn outlasted wool rugs of comparable quality by three to one. Because the yarn has a hard, smooth surface, it is said to shed dirt and be easier to clean.



Under Your Hat

No man from Mars, this model-plane enthusiast wears his weird helmet to tote a radio-control transmitter. Converted from a football helmet, it has an aerial on top. The radio orders are picked up by a receiver under the wing of the gas-powered model.



'Scope Aids Marksmen

A MARKSMAN doesn't have to squint to pick out a target through this new 20-power spotting 'scope. The maker, Bausch & Lomb, says its 60-mm. aperture and improved optical system bring in a brilliant image, with pin-point definition, even when your eye is held a full inch from the eyepiece. This not only saves eyestrain but avoids the danger of banging your glasses against the eyepiece or jostling the 'scope out of alignment. Less than 14 inches long, the instrument fits easily into any shooting kit.

Do You Know Your New Air Force?

Jet takes the lead in this array of new Air Force planes. See how many you can name, then check answers printed upside down across the bottom of the page.



1. Of conventional design, this was the first six-jet bomber in the world to be flown. The plane is still in experimental stage.



4. This one you should get easily. It's the most famous USAF jet fighter. There's an air scoop on each side of the fuselage.



5. Yes, it looks like the B-29 Superfortress, but it's really 75 percent new plane. Engines are more powerful, and range is greater.

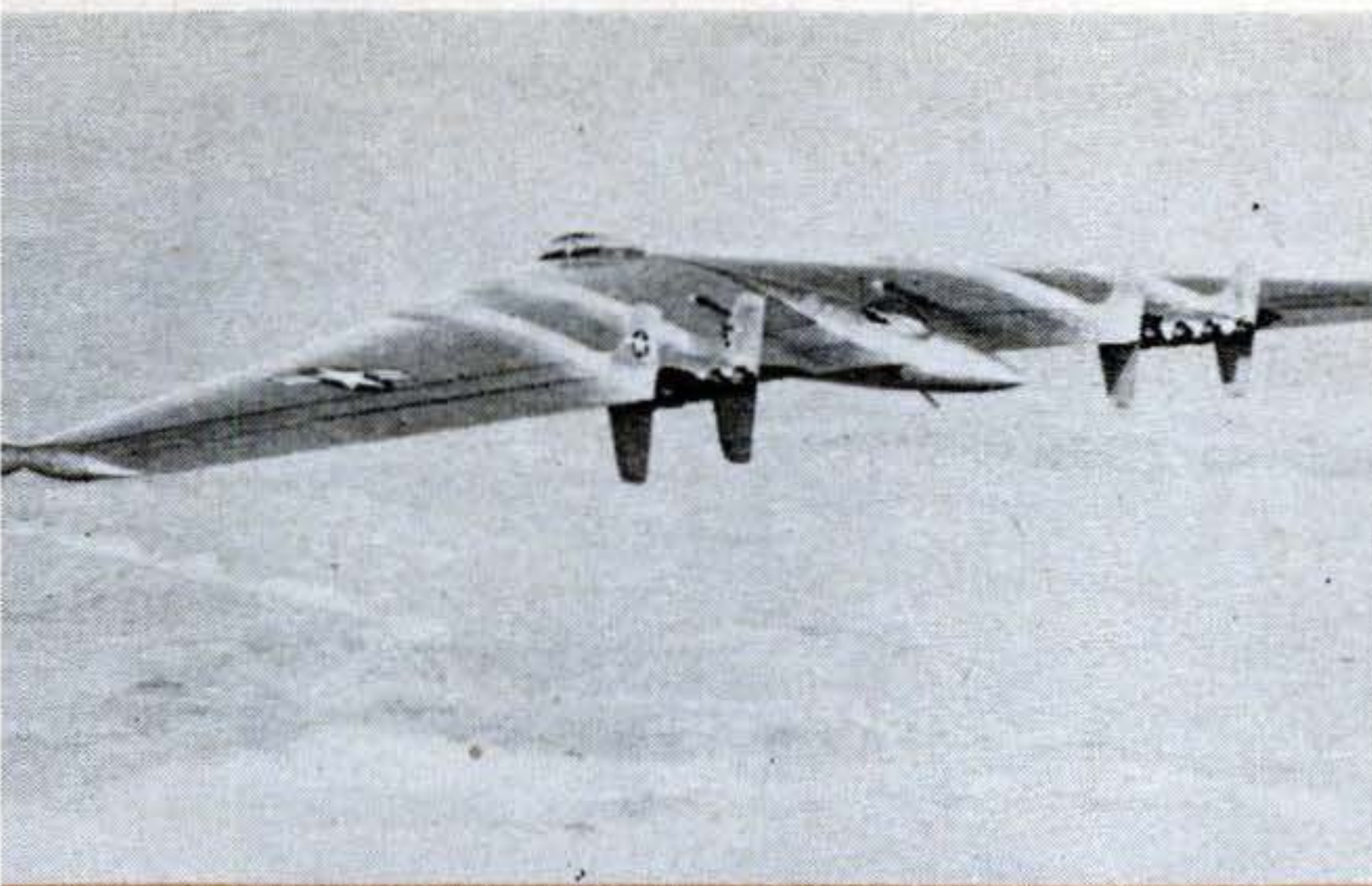


8. Called the world's largest bomber, it is designed to carry 10,000 pounds of bombs 10,000 miles. Note the six pusher props.



6. Air for the single jet engines of these fighters is sucked in through the nose. Their speed is rated at more than 600 m.p.h.

7. Boeing XB-47; 8. Consolidated B-36; 9. Republic F-84; 10. Consolidated XB-46; 11. North American B-45.



2. There should be no mistaking this tailless, propellerless craft. Note the eight jet exhausts of this new long-range bomber.



3. The Air Force is getting this new plane ready for production. An all-weather, jet-propelled fighter, it has a speed of 600 m.p.h.



6. A single jet engine powers the world's first fighter with sweptback wings. It is designed to fly faster than 650 m.p.h.



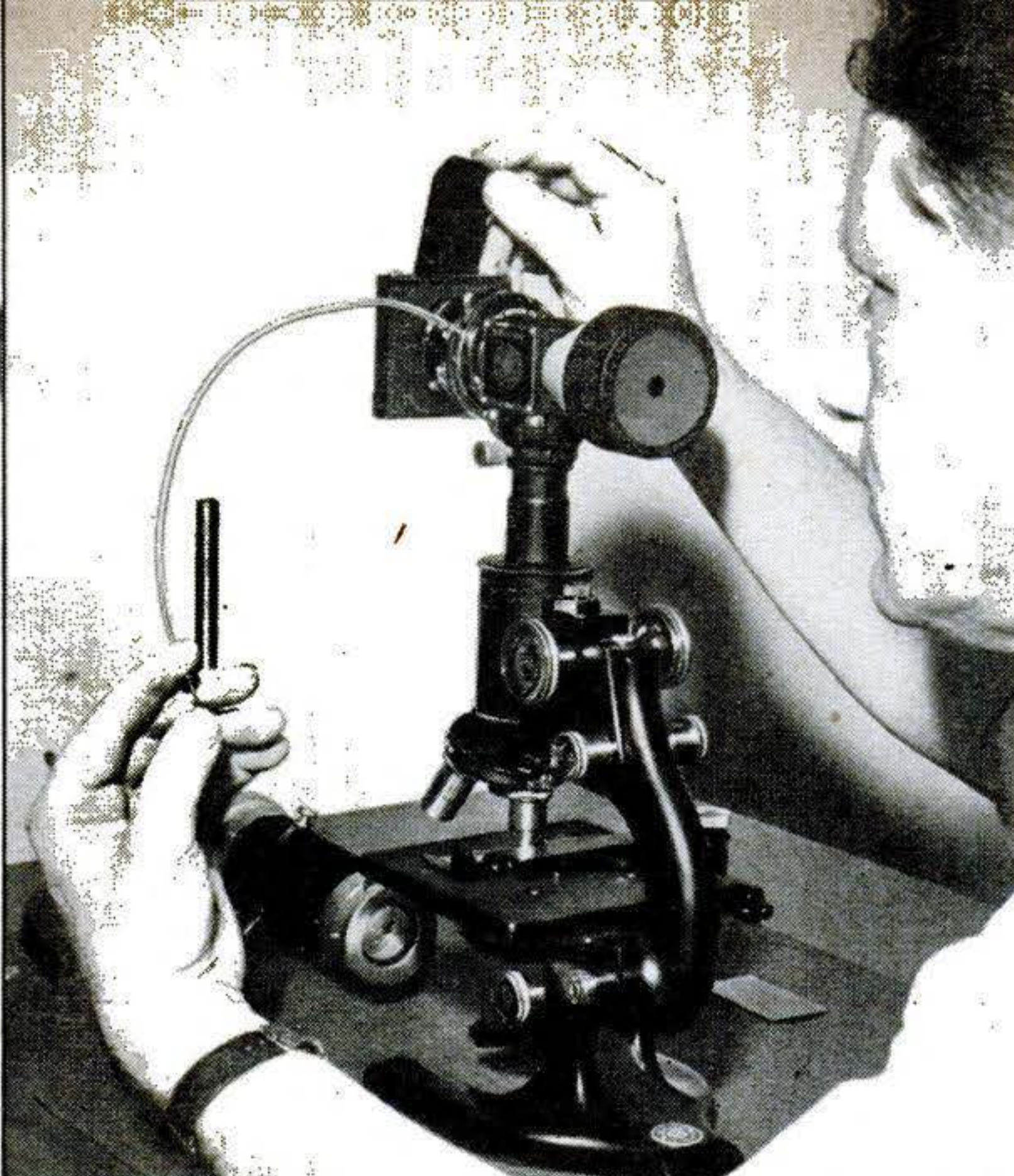
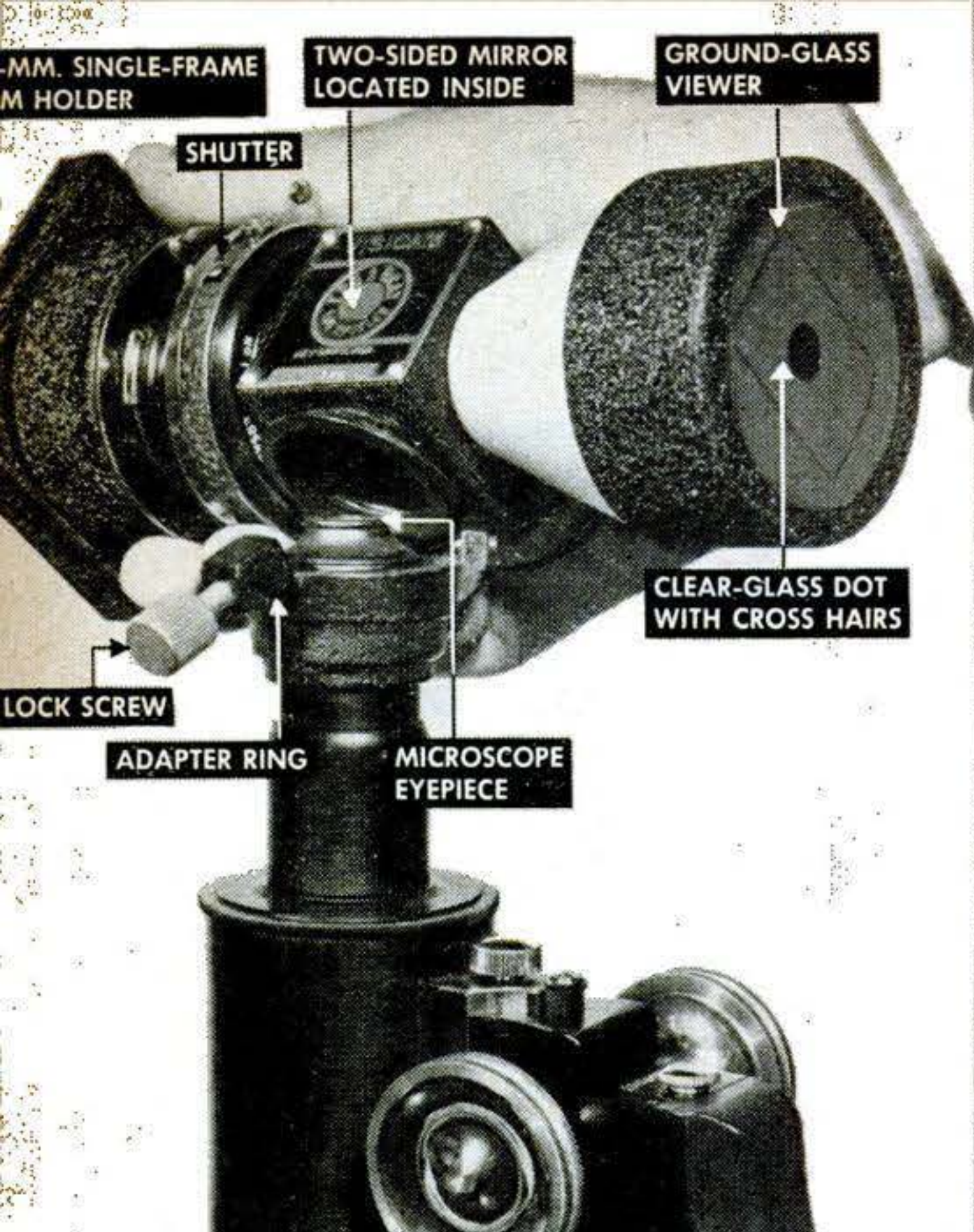
7. Sweptback wings again, but this time it's a bomber with six jet engines slung under the wings. It's still in experimental stage.



10. It may look like a twin-jet fighter, but there are two jet power plants in each of this huge new bomber's two nacelles.



11. This medium bomber also has a slender fuselage. It is powered by four jet engines that speed it along at close to 500 m.p.h.



Microscope camera weighs only 12 ounces, is easily attached to top of eyepiece with single screw (left). Adapters permit it to fit nearly any microscope. After image is focused on

viewer, film is inserted in holder (right). Shutter is tripped by ordinary cable release. Film-holder can be replaced with some types of standard cameras after removal of their lenses.

Lensless Camera Lets Microscope Make Photo

You can take a picture of a germ as easily as snapping a pretty girl with this photographic attachment for microscopes.

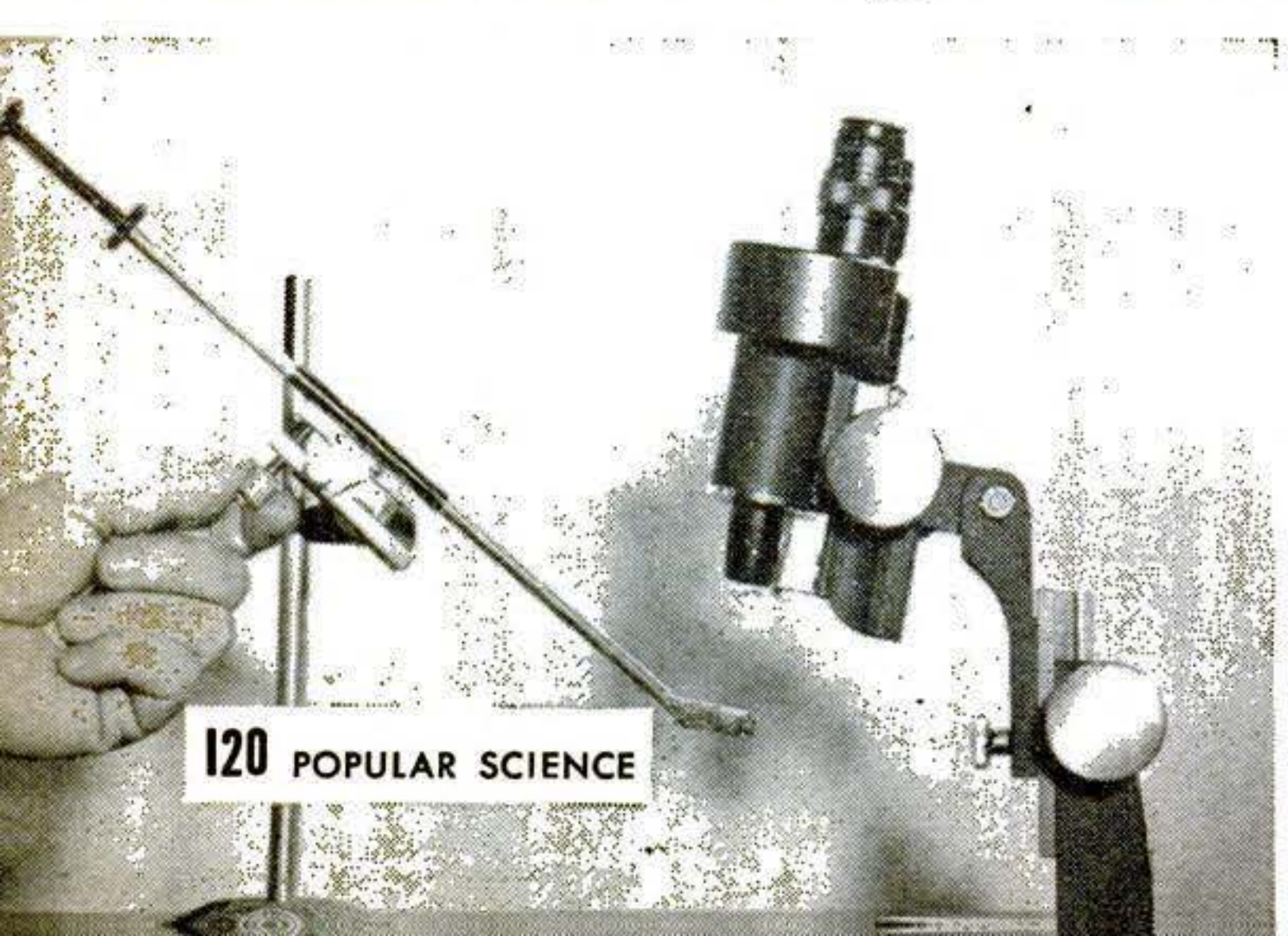
Called Visicam[®], it has a ground-glass viewer, 2 inches in diameter, on one end and a single-shot film holder on the other. Midway between them is a two-sided, angled mirror that reflects the microscope's image onto either the viewer or the film.

The operator simply focuses the image on the viewer, then rotates the mirror in the opposite direction to angle the image toward the film. A built-in shutter permits speeds from one to 1/100 of a second. The microscope's optical system serves as the lens.



Enlarged 1,000 times, microscopic sea plant appears on viewer just as it will on film. Dark spot contains cross hairs for sharp focusing. Black lines help operator center image on film.

Mechanical Finger Gives Microscope a Hand



THIS mechanical forefinger and thumb can do all your own can do—and do it better. Called the Harper Manipulator[®], it makes it easy for scientists to position minute, hard-to-hold objects under a microscope.

Tiny specimens are grasped between two small pinchers, opened and closed by a plunger. The arm itself can be moved in any direction and completely rotated. Two screws lock it in the desired positions.



Truck Totes 74-Ton Shaft

RESEMBLING a huge cannon, a 74-ton rotor shaft for a new generator is shown being eased down a hill to the East Powerhouse of Grand Coulee Dam in Washington. The 32-foot shaft, brought across the top of the dam aboard this multiwheeled trailer truck, will

be fitted with more than 500 tons of steel and copper to form the rotating part of man's largest hydroelectric generator. Nine similar units are now operating in the dam's West Powerhouse. Three of the new 108,000-hp. generators will be completed next year, three in 1950, three in 1951. Each will be driven by a 150,000-hp. turbine.

Fruit Goes By Trailer

GRAPE pickers in a 9,500-acre vineyard at Di Giorgio, Calif., now save time and steps by loading directly into these 6-ton hoppers. One problem in designing them was how to keep a train of four or more from cutting corners in turning out of tight rows. This was solved by connecting the two axles with crossed steering arms that turn the rear wheels in the same arc as the front wheels, like those of a hook-and-ladder truck. Thus each trailer in a train follows exactly the track of the tractor.

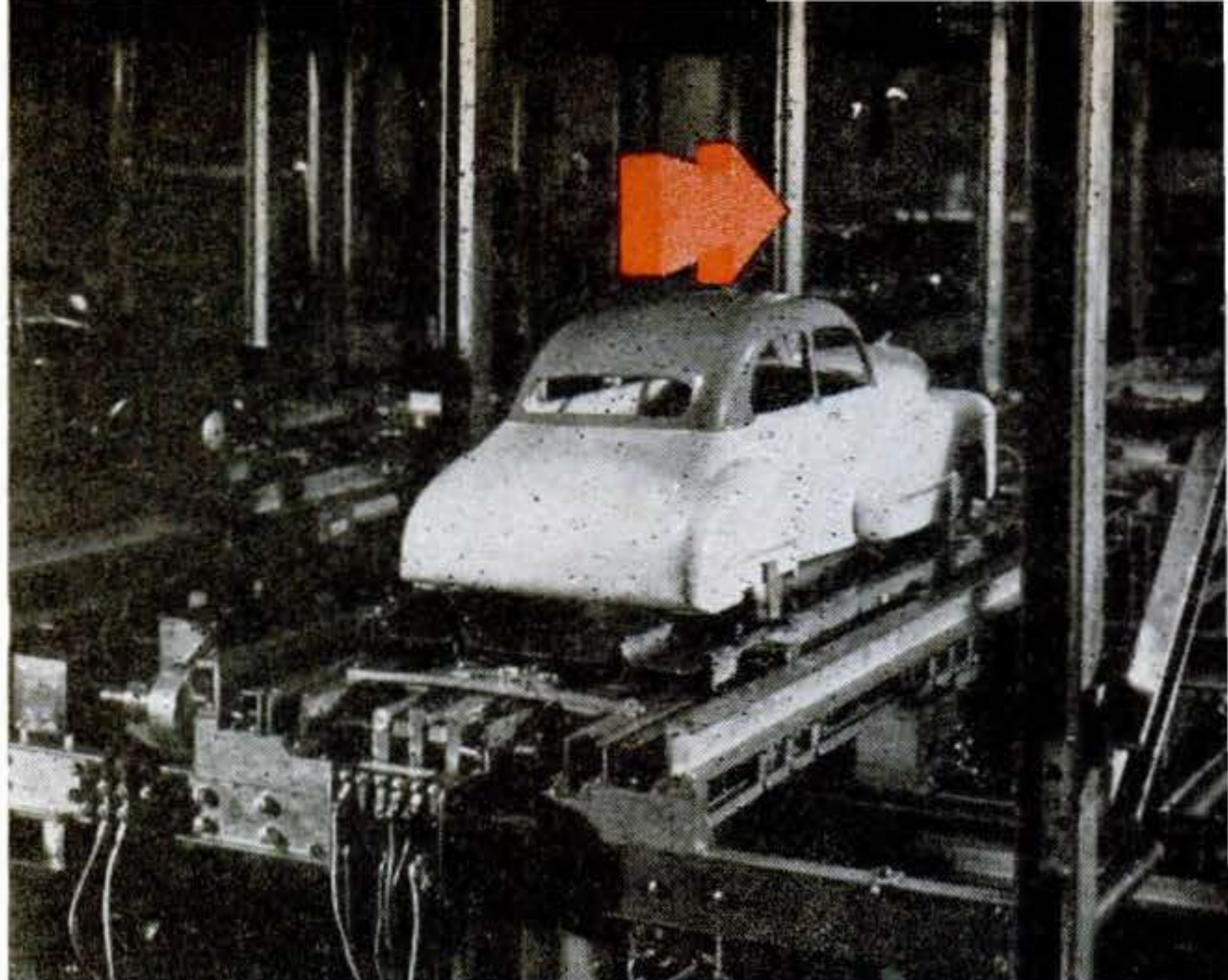


Coin in Slot Parks and Delivers Car

PS photos by Hubert Luckett

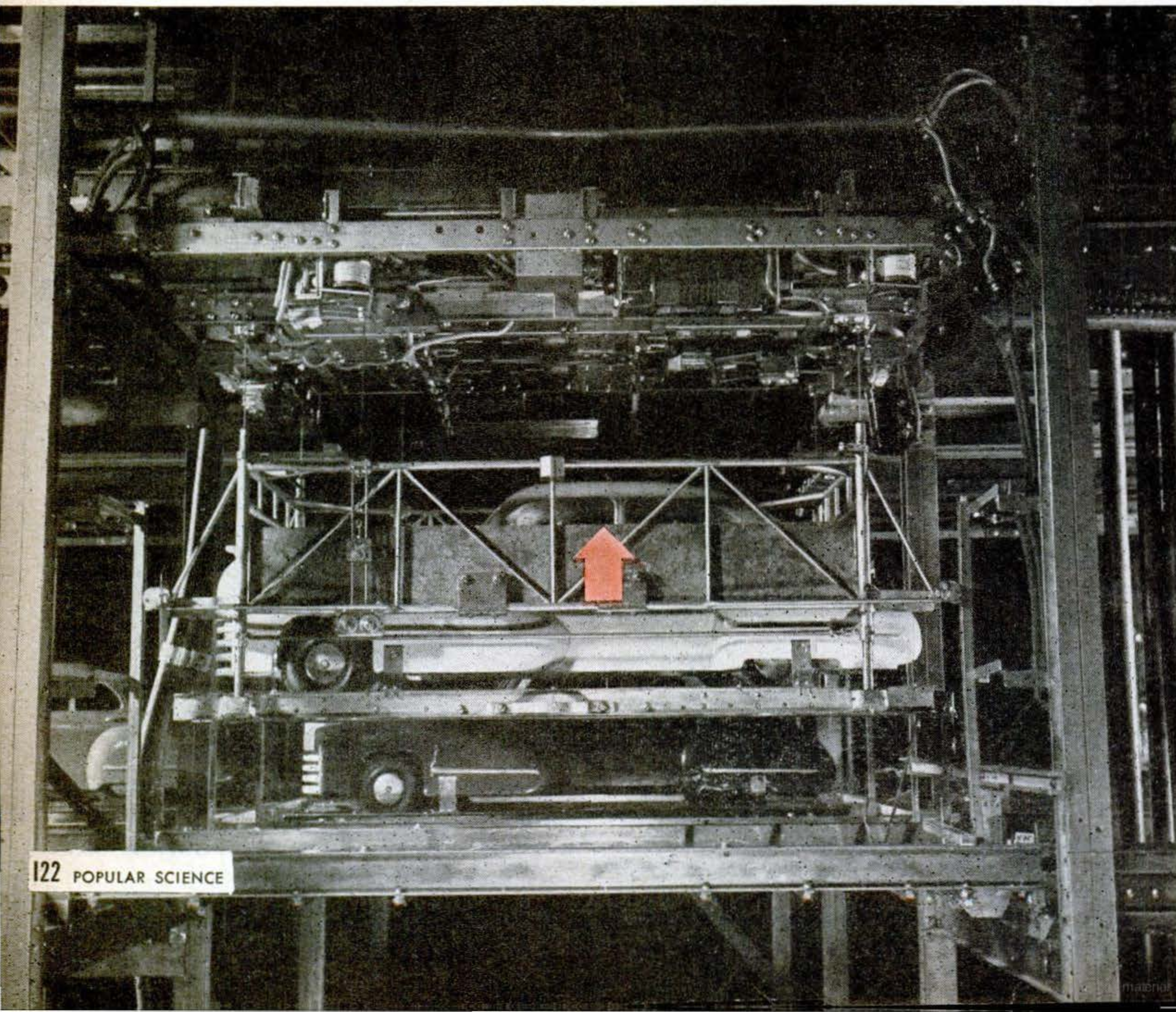
THIS scale model of a completely automatic parking garage shuffles cars the way a juke box files and picks out phonograph records. A New York real estate man, William Zeckendorf, developed it for efficient use of high-priced city land. Besides saving labor by operating at the drop of a coin in a slot, it saves space by having no ramps or unoccupied aisles. The model, built to a scale of one inch to the foot, is run by 34 airplane-control motors.

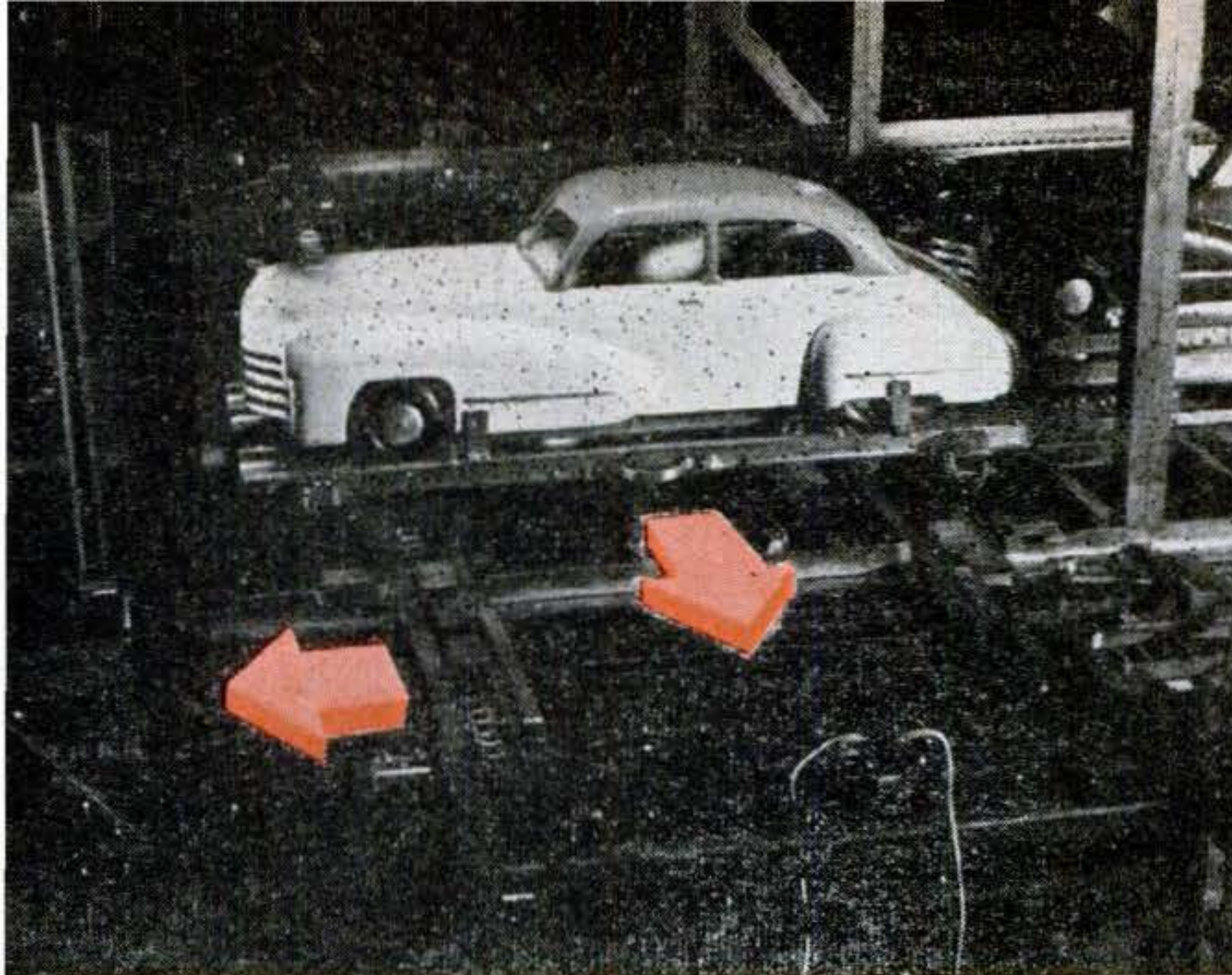
4 Horizontal conveyer takes over to move car to its berth. An overhead crane drops a frame over car, picks up dolly, as shown below, and carries both over tops of other parked cars



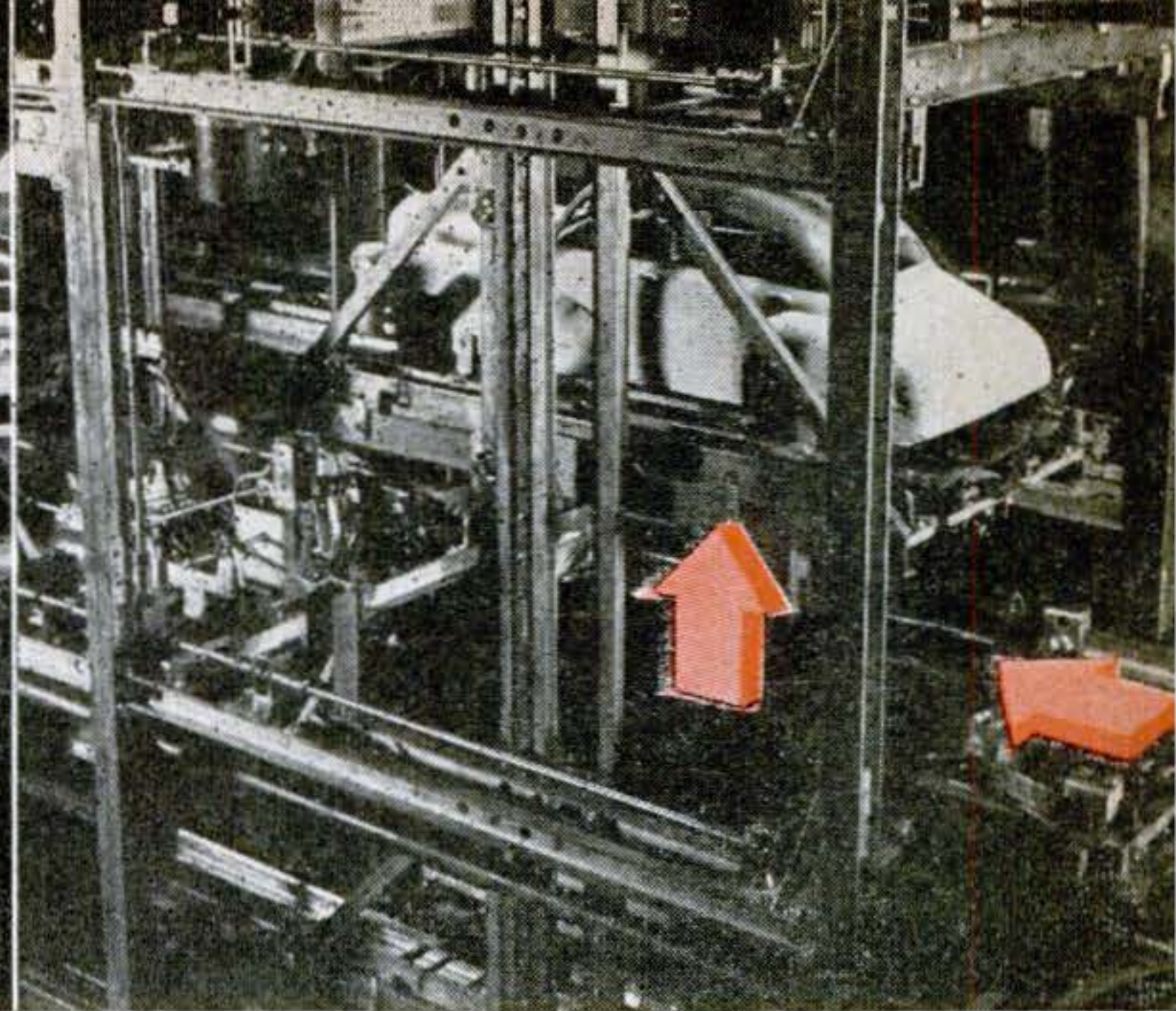
1 At entrance station, car is driven onto dolly on which it will rest all the time it is in the garage. Customer can set brake and lock door, because no one else will have to touch his car. Owner drops a coin in the slot and receives a token for reclaiming his car later.

to vacant stall. There frame lowers car into stall, and automatically detaches itself from dolly. Crane then can pick up a car for delivery or return empty to the incoming elevator.





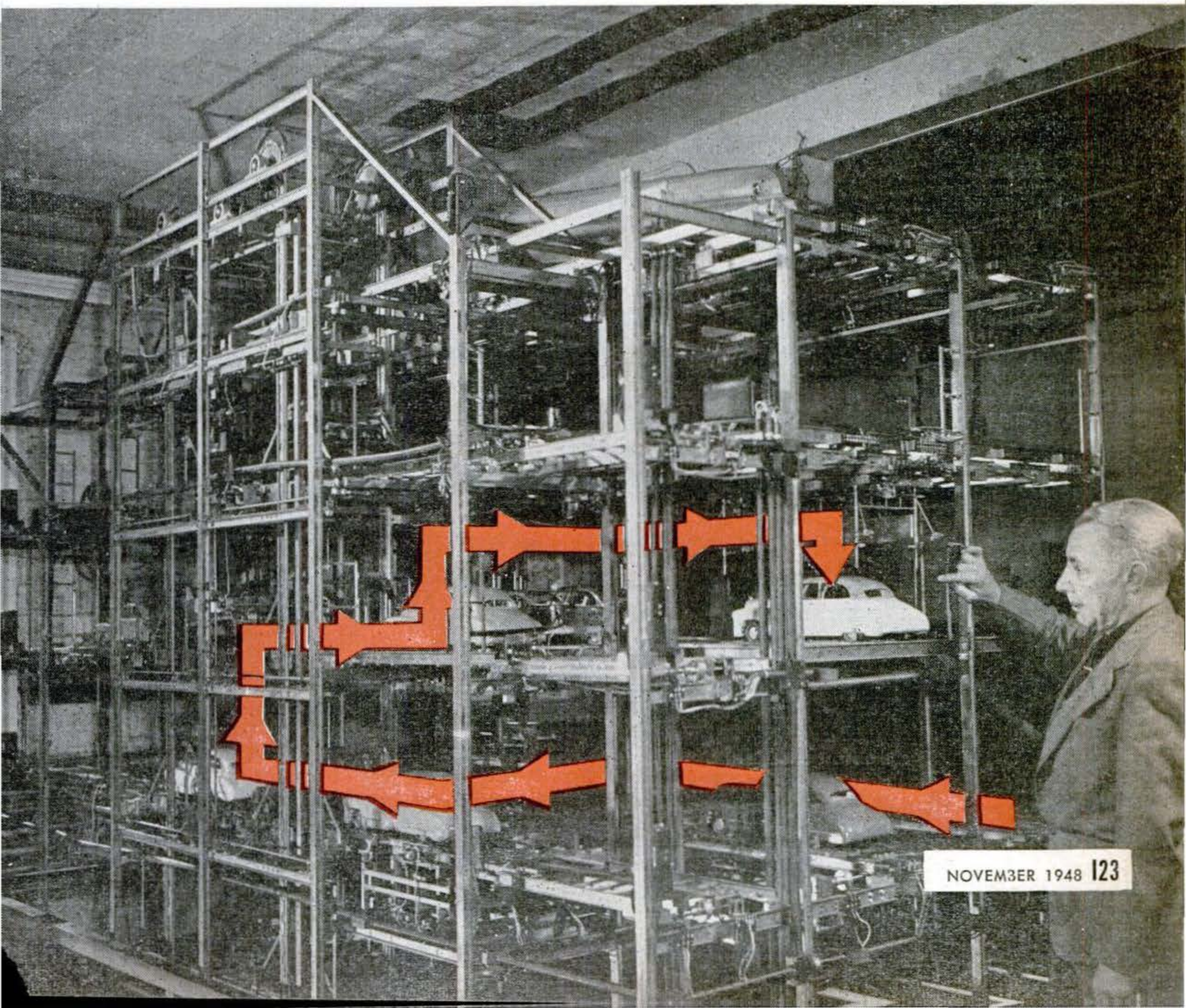
2 Car locked on dolly starts trip to automatically selected stall. Dolly is first brought forward to transverse conveyer. This carries it across garage, a few inches above floor level, to elevator. There the dolly is lowered onto rollers, pushed into an elevator, and locked safely.

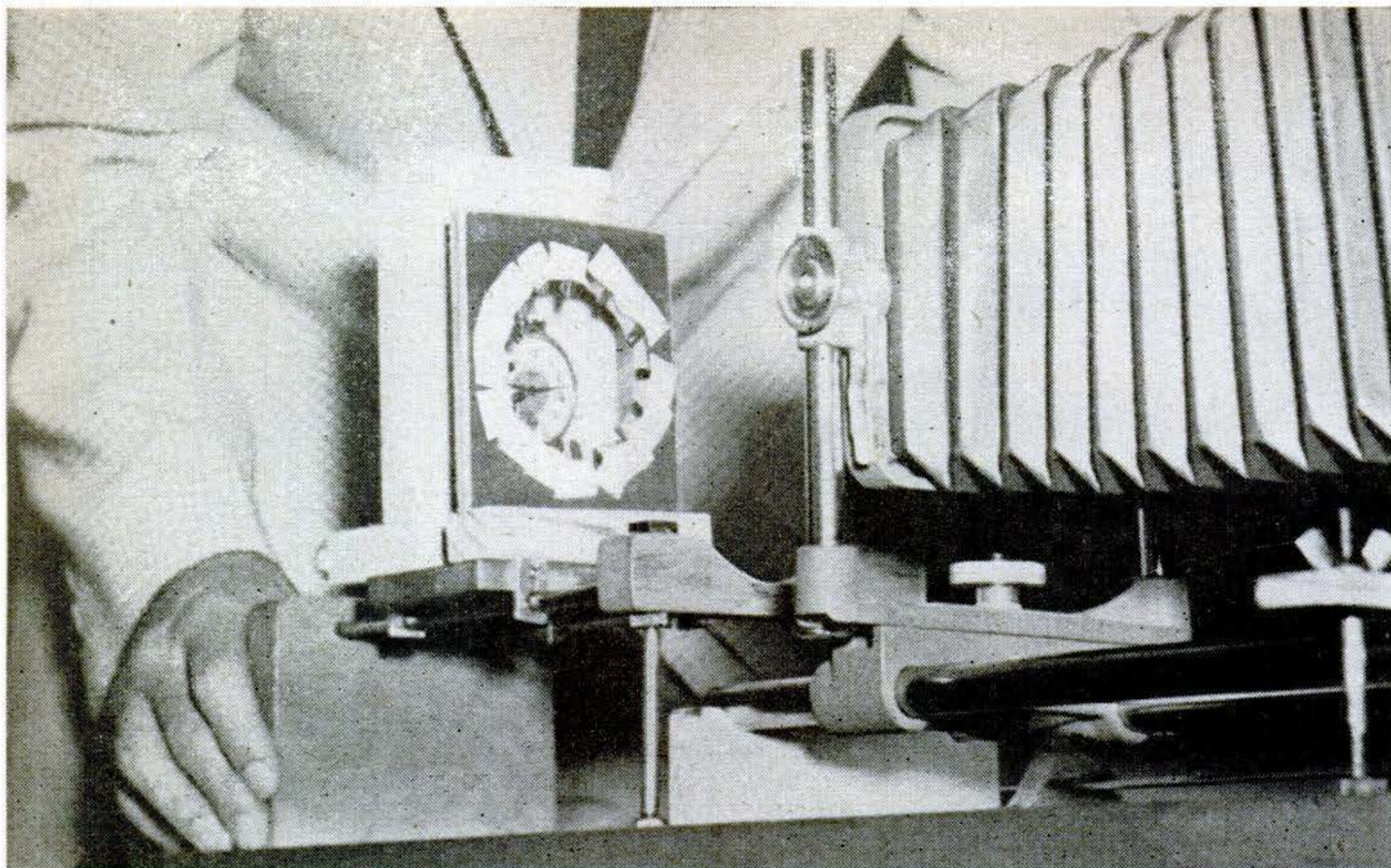


3 The elevator, drawn up an open shaftway by an endless chain, hoists the car to its pre-assigned parking level. There automatic locks and leveling devices hold the elevator steady while a mechanical arm reaches out and pulls the dolly onto another roller platform.

5 Car's path from entrance station to parking stall is traced by red line on photo below. When customer calls for it, he simply drops token into slot at exit station. Same system of

horizontal conveyers then brings car to door by way of exit elevator. Designers say a 10-level garage like this, on ground space 100 by 200 ft., could handle a total of 3,940 cars a day.





Battery of 15 fireflies is "focused" on watch to be photographed. Adhesive tape holds them to wooden ring, with their tails projecting over its inner rim, in front of studio camera.

Fireflies Light Photo

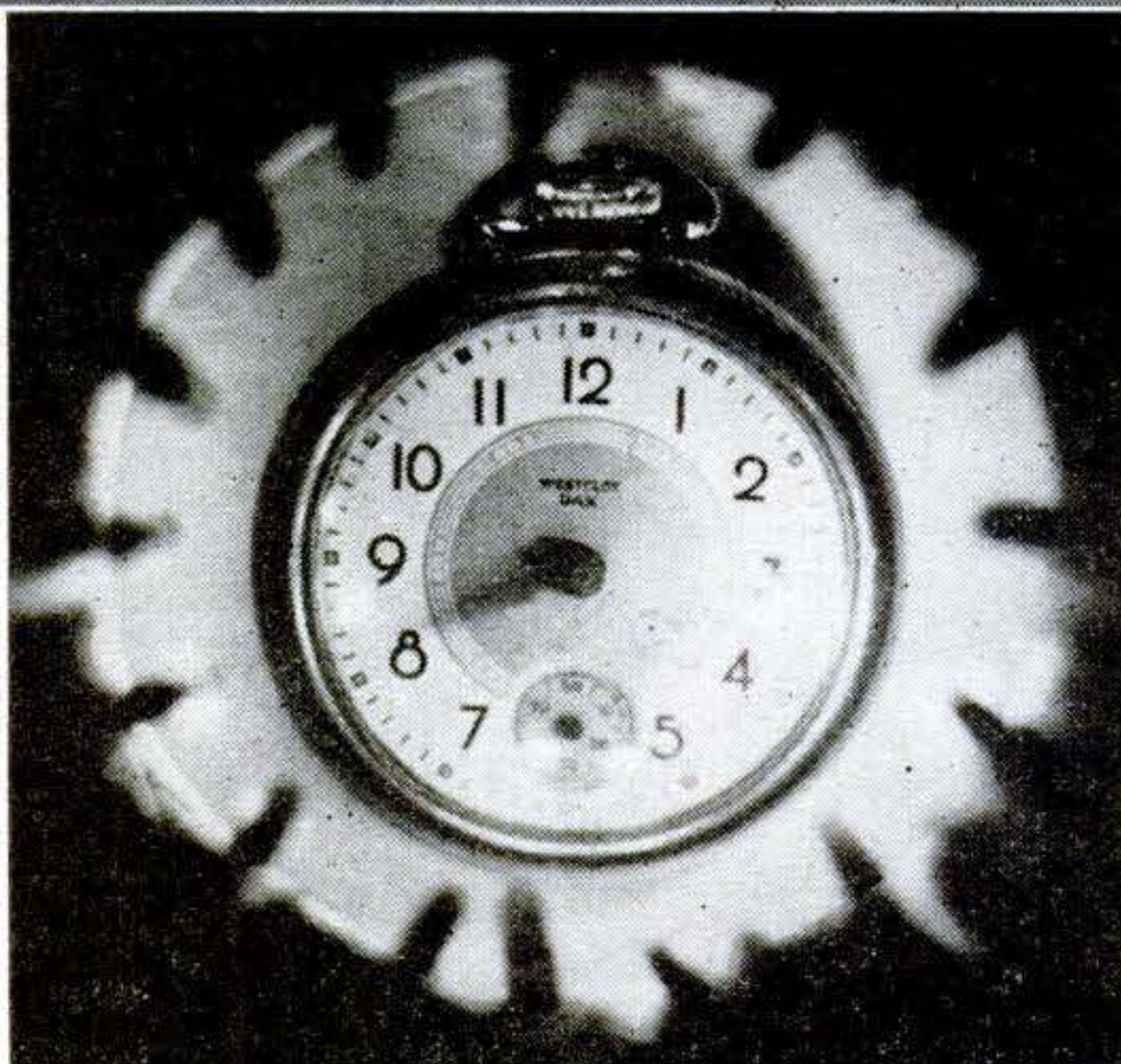
THOUGH makers of photo lamps probably need not worry yet about competition from fireflies, those little lantern-carrying beetles *can* be used as a substitute for flashbulbs in taking photographs.

This was demonstrated for the first time recently in the Mississippi State College photographic laboratory at State College, Miss. The setup and result are shown in the pictures above and at right.

The experiment left unanswered the question of how fireflies produce their light. All that's known is that a greenish glow somehow results when two substances in their tails, luciferin and luciferase, are combined with oxygen from air forced through a network of fine tubes.

Why fireflies light up is simple enough: their flash is a mating call. The male, flitting about, glows brilliantly, while the female sits demurely in the grass and flashes a faint response. Result: boy meets girl.

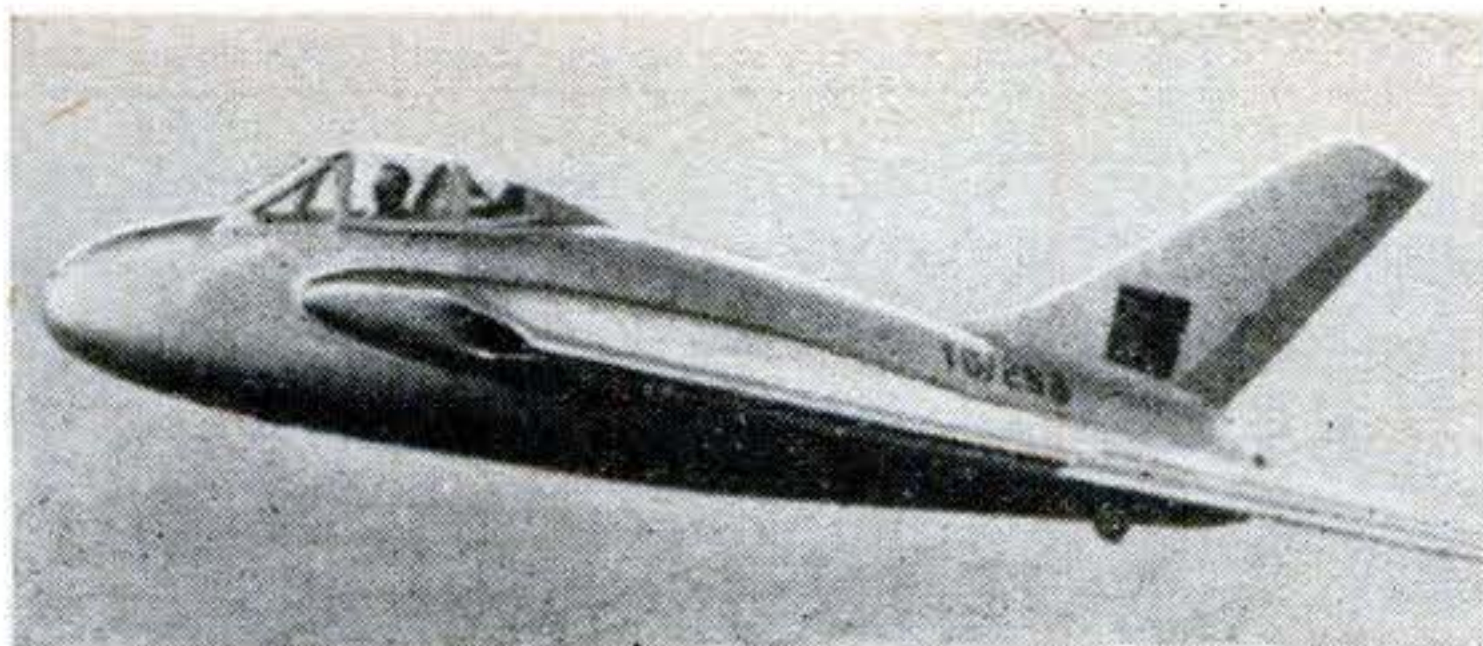
Males were used in the demonstration pictured here.



This is the picture taken by firefly light in a dark room. Hands of watch don't show because of their movement during hour-long exposure.

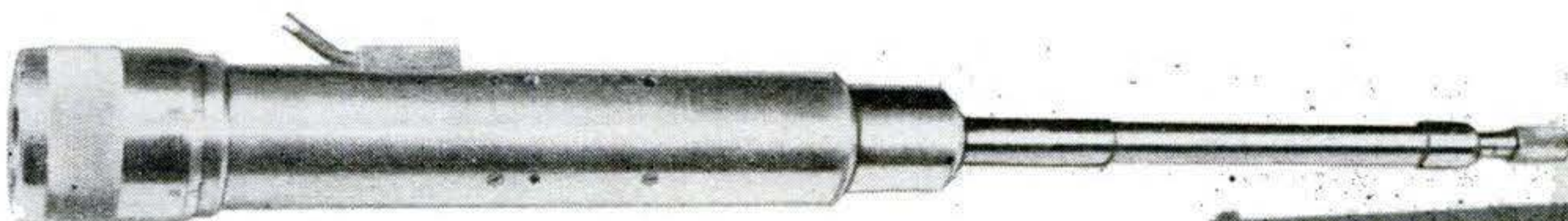


Firefly's tail light is an efficient lamp, for its size, since it emits none of the infrared or ultraviolet rays invisible to the human eye.



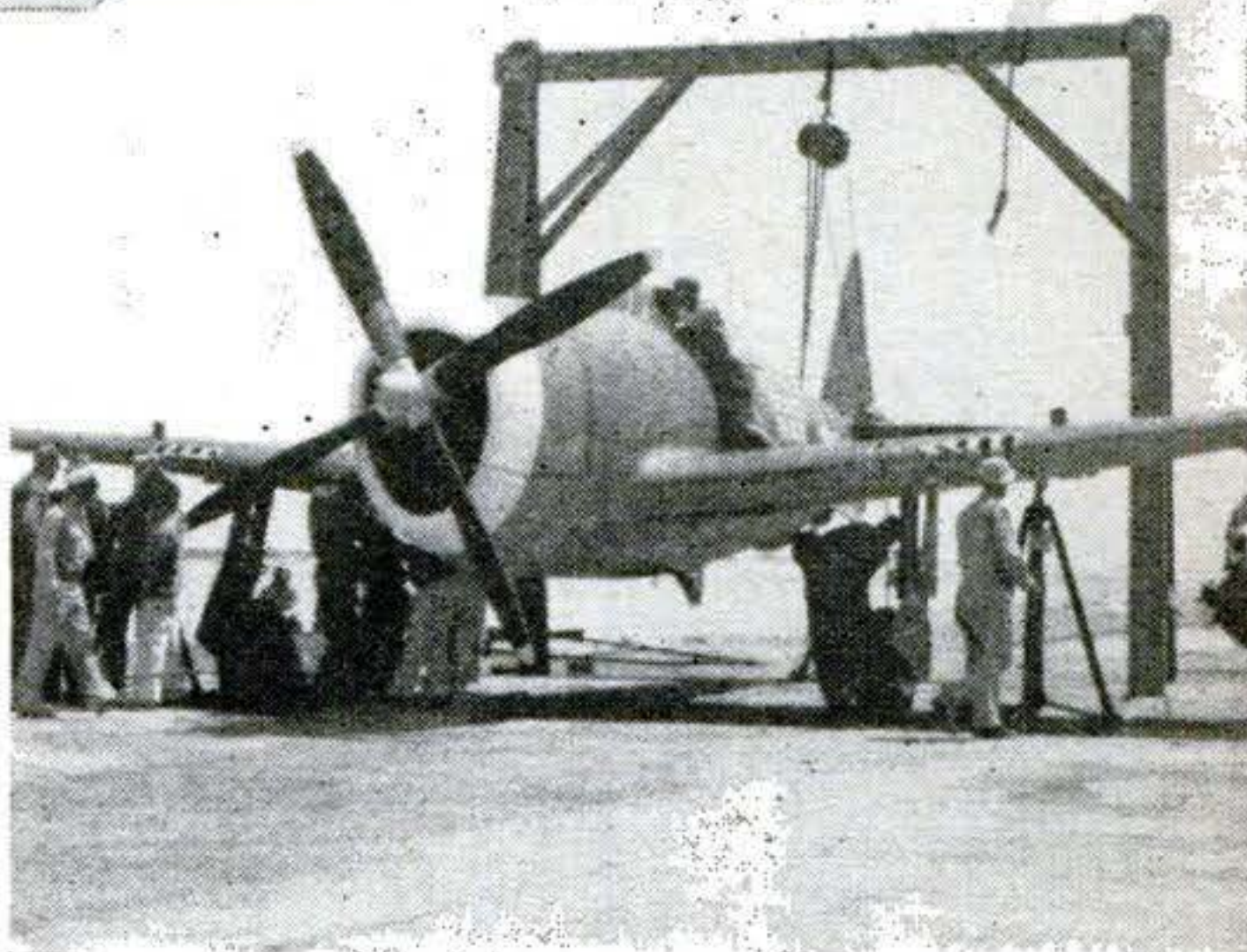
British Outfly Sound

THE De Havilland 108 jet plane shown here recently flew faster than sound. The speed was not announced, but is believed to have been around 700 m.p.h. An experimental plane, like the U. S. Air Force's X-1, which has exceeded the speed of sound many times, the British sweptback Swallow differs in that it can take off under its own power. The X-1 (PS, Aug. '48, p. 96) must be launched at high altitude from a B-29.

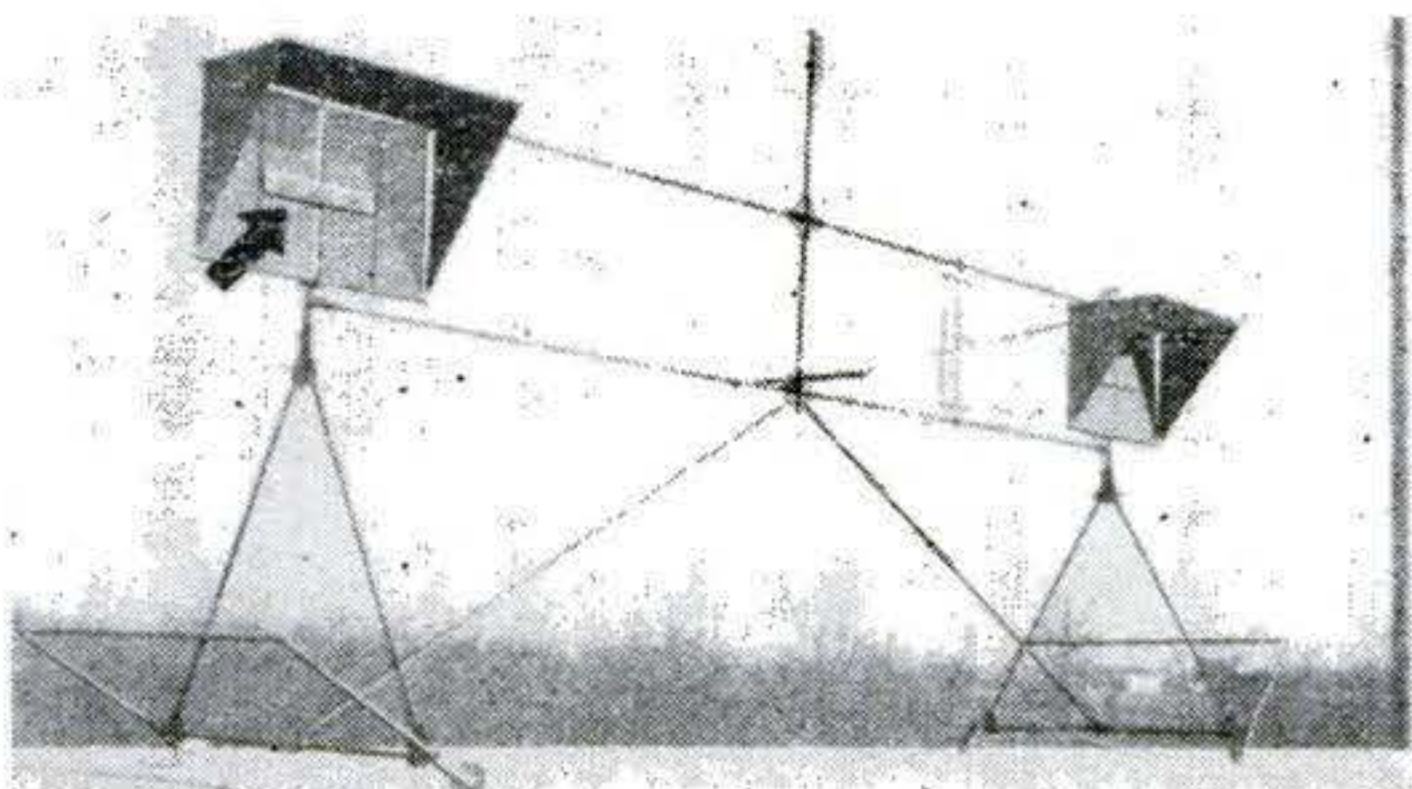


Arc Lamp Aims Guns

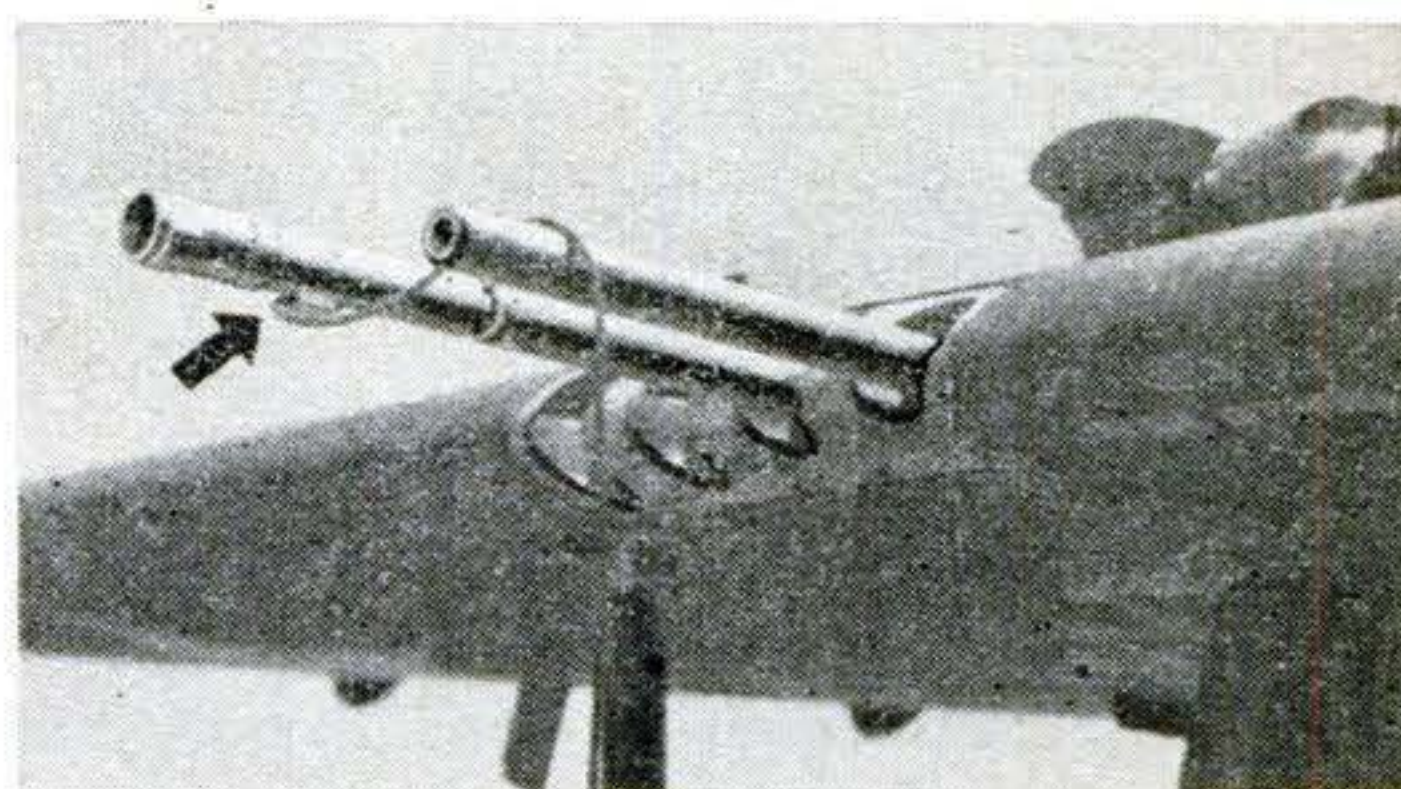
To make a kill, the multiple, wing-tip machine guns of fighter planes must be harmonized so that their bullets will concentrate on the aiming point—an enemy plane or ground installation. This adjustment, called “boresighting,” can be done by using an optical device similar to a telescope, but inaccuracies result from human error due to parallax. To overcome this, a light-ray method of boresighting has been perfected, using the concentrated arc lamp developed by Western Union for communications during the war (PS, July '46, p. 98). The gadget that does it is illustrated above.



1. Tail and wing jacks are used to level an F-47 Thunderbolt to the “attitude” it would assume while speeding at 300 m.p.h. Its .50-cal. guns are aimed at a correcting target.



2. Background of each target, mounted on a lightweight, collapsible framework, is covered with Scotchlite®, a highly reflecting material. Arrow indicates four red-button aiming points.



3. The arc-lamp boresighting device is shown at left, above, inserted in the muzzle of a machine gun. When the projected light beam hits proper red spot on target, the gun is aligned.

Life-Saving Lightning Born in Back-Yard Lab



In heavy storms and pea-soup fogs, this new, 2/3-mile-long lighting system at Idlewild Air-

port flashes a brilliant pointer 1,000 feet in the air to help guide blinded pilots safely in.

A modern Zeus hurls miniature lightning bolts to mark the sky road to safety for fog-bound fliers.

By George H. Waltz, Jr.

BRILLIANT flashes of man-made lightning, born in a back-yard garage, are now guiding planes to safe landings at America's foggiest airport.

Produced by a row of cigarette-size lamps, the boltlike streaks of light pierce the soupiest weather to lead planes to the landing strip at California's Landing Aids Experiment Station near Arcata. Soon they will be assisting giant air liners into New York's International Airport at Idlewild.

Designed to help take the blindness out of blind landings, the new all-weather approach system—a Westinghouse development—uses 35 of the world's brightest lights and 34 neon lamps. Arranged alternately in a long line stretching out from the end of a runway, the 69 lamps flash on and off in rapid succession to form a vivid ribbon of light that is visible at 1,000 feet through zero-zero fog.

Viewed from the air, the lights start appearing near the inner radio marker to

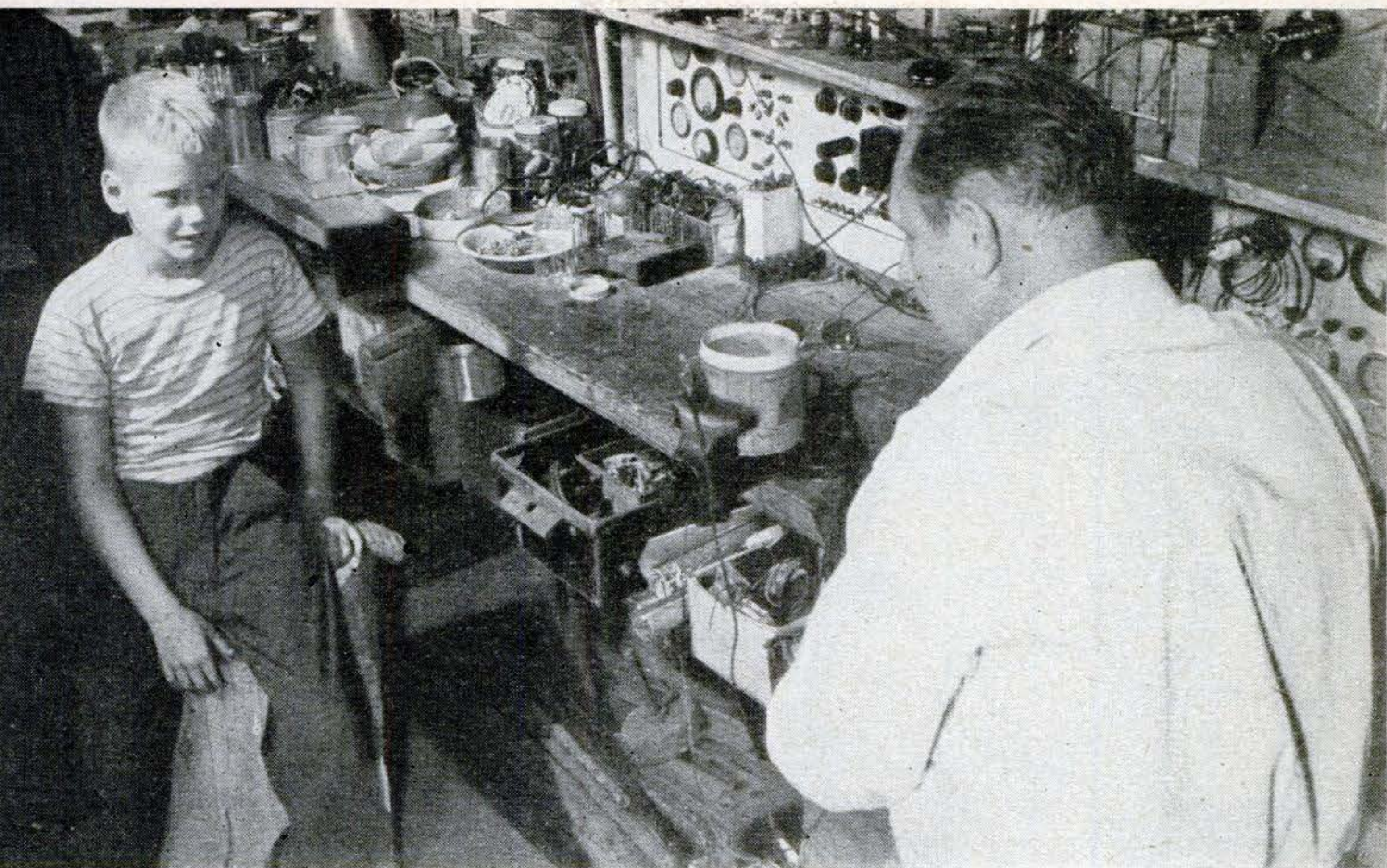
which pilots are guided by the airport's instrument landing system (ILS). From that marker they dart, like a guiding finger, toward the beginning of the runway. Once over the radio marker, pilots simply follow the lightninglike streaks into a landing.

The new lighting system itself is an important news item (PS, July '47, p. 133). But the dramatic story behind its development is even more intriguing, particularly to the home experimenter.

Four things made the new all-weather approach lighting system possible: a new brilliant light called the krypton lamp, the stubborn curiosity of a scientist, a garage laboratory behind the scientist's home, and the cooperation of his family, friends, and the neighborhood kids.

During the war, Bill Pennow, a Westinghouse researcher in Cleveland, spent his normal working hours thinking up new and better searchlights for the Navy. As his experimental work with light beams progressed, he became fascinated with the problems of sending light through dense fog. He wondered just what kind of light was needed to pierce the heaviest weather.

Working with pencil, paper, and slide rule during his spare time, Pennow rooted



In his garage laboratory. Westinghouse's Bill Pennow worked stubbornly to discover the new

lighting system. Neighborhood kids were willing guinea pigs in tedious eye-reaction tests.

out some of the mathematical answers to the problem. First of all, he decided that to punch light through the kind of ground fog that ties up airports he would need something like 1,000 times more light than was obtainable from any lamp commercially available at that time. He also decided that what he needed was not just light, but *lightning*.

Bill Pennow found his lightning source in a special super-light developed by Westinghouse research engineers, during the war, for night aerial photography. The lamp's slender quartz tube is filled with krypton, one of nature's rarest gases. When a surge of high-voltage electricity from a miniature artificial-lightning generator is discharged through the gas, the lamp flashes with a brilliance of 9,000,000 candlepower per square inch—nine times greater than that of the sun! It literally produces a flash of man-made lightning lasting 17 millionths of a second, or about 1/10 as long as a flash of nature's lightning.

Pennow was confident that the krypton lamp's flash would penetrate the thickest fog. His next problem was to find out what effect such a powerful light might have on a pilot's eyes. Would the brilliant flashes

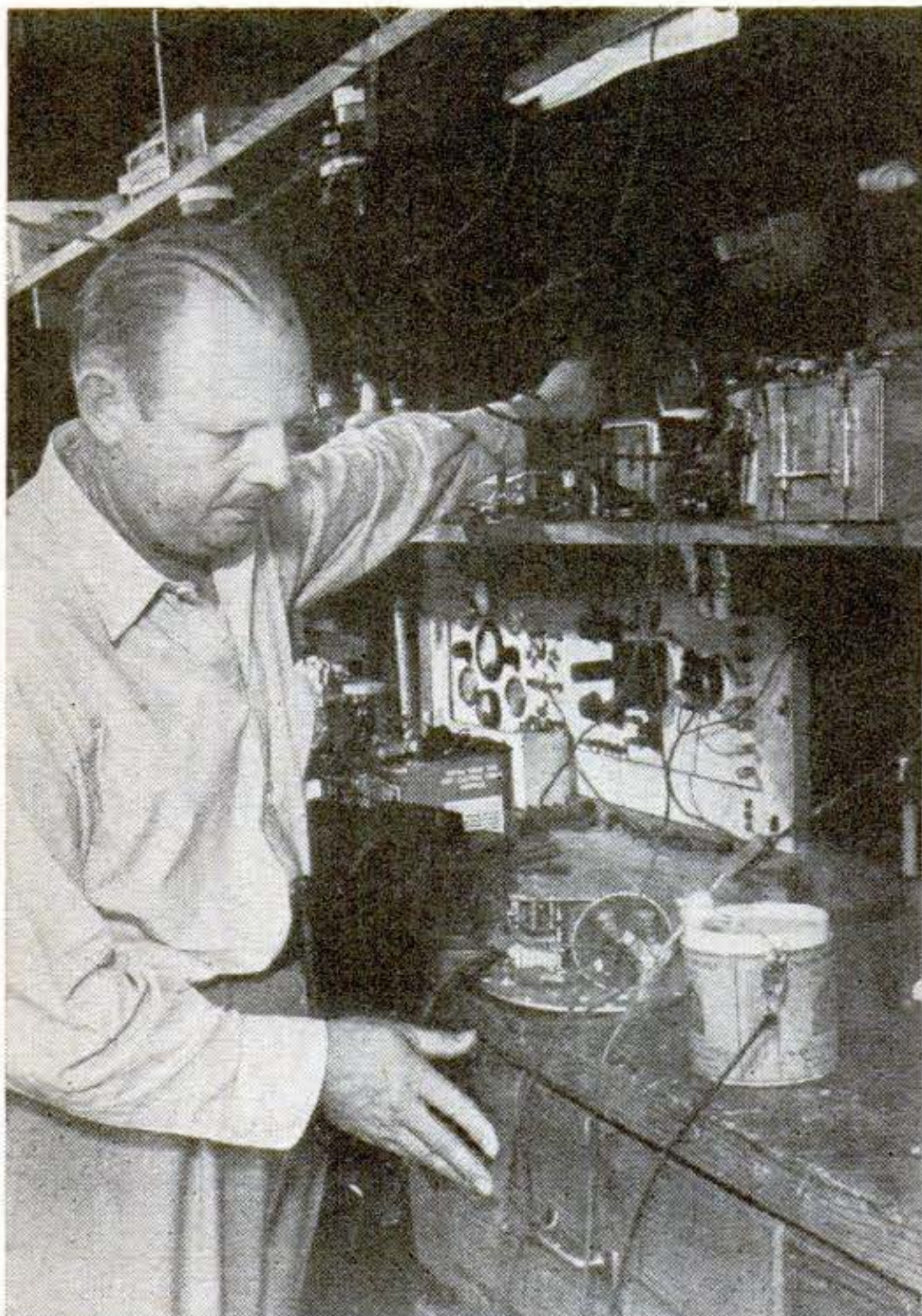
blind him? Or would they help him to grope his way down through heavy weather?

Text books and the reports of earlier experiments proved of little help. Most material on the subject was vague. No one had ever thoroughly investigated the physiological effects on the human eye of short changes in light intensity.

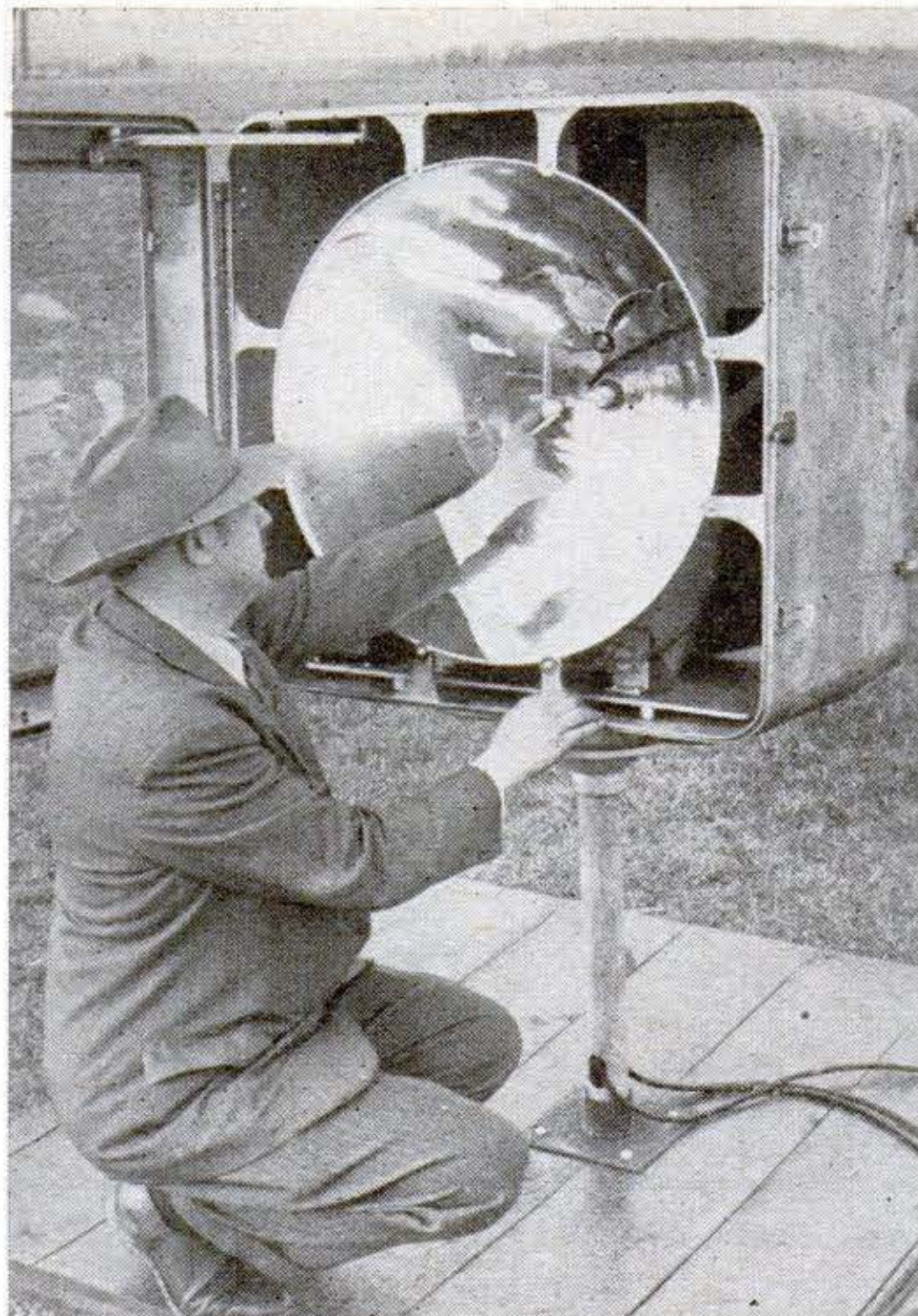
Bill took that problem out to his private two-car garage in back of his house. Garden tools, old tires, and odds and ends of stored furniture were cleared out to make way for homemade laboratory gear. He set up various types of flashing lights. He installed optical test instruments and sensitive recording equipment.

For his human guinea pigs he called on his family and his friends and rounded up the neighborhood youngsters. Few visitors to the Pennow home during those days escaped without a visit to the Pennow garage-laboratory to have their eyes checked against the effects of Bill's flashing lights. More than one local teen-ager gave up some of his play time to look at a flashing light while Bill Pennow slowly increased the length of the flashes until the youngster blinked.

Working with his homemade equipment



Heart of lighting system is krypton lamp. Here Pennow works on one of the original models. Lamp's flash lasts only 17 millionths of a second, is nine times brighter than sun.



Lamp's reflector is biggest part of unit. Krypton lamp itself, scarcely visible in the center, is only four inches long and no thicker than a fountain pen. The system uses 35 such units.

in his back-yard laboratory, Pennow learned some amazing things. He found that no light can flash fast enough to avoid detection by the human eye. Even light pulses as short as a millionth of a second are perceptible.

But more important, he discovered that when eyes are adapted to darkness—as a pilot's are at night—the iris refuses to respond to any change in light intensity shorter than $1/1,000$ of a second. In other words, he found that the normal eye can look at the most brilliant flash of light without the iris shutter closing or the eye being harmed—if the flash is brief enough.

Out of these home-laboratory experiments grew the combination of krypton plus neon lamps for the new Westinghouse approach-lighting system.

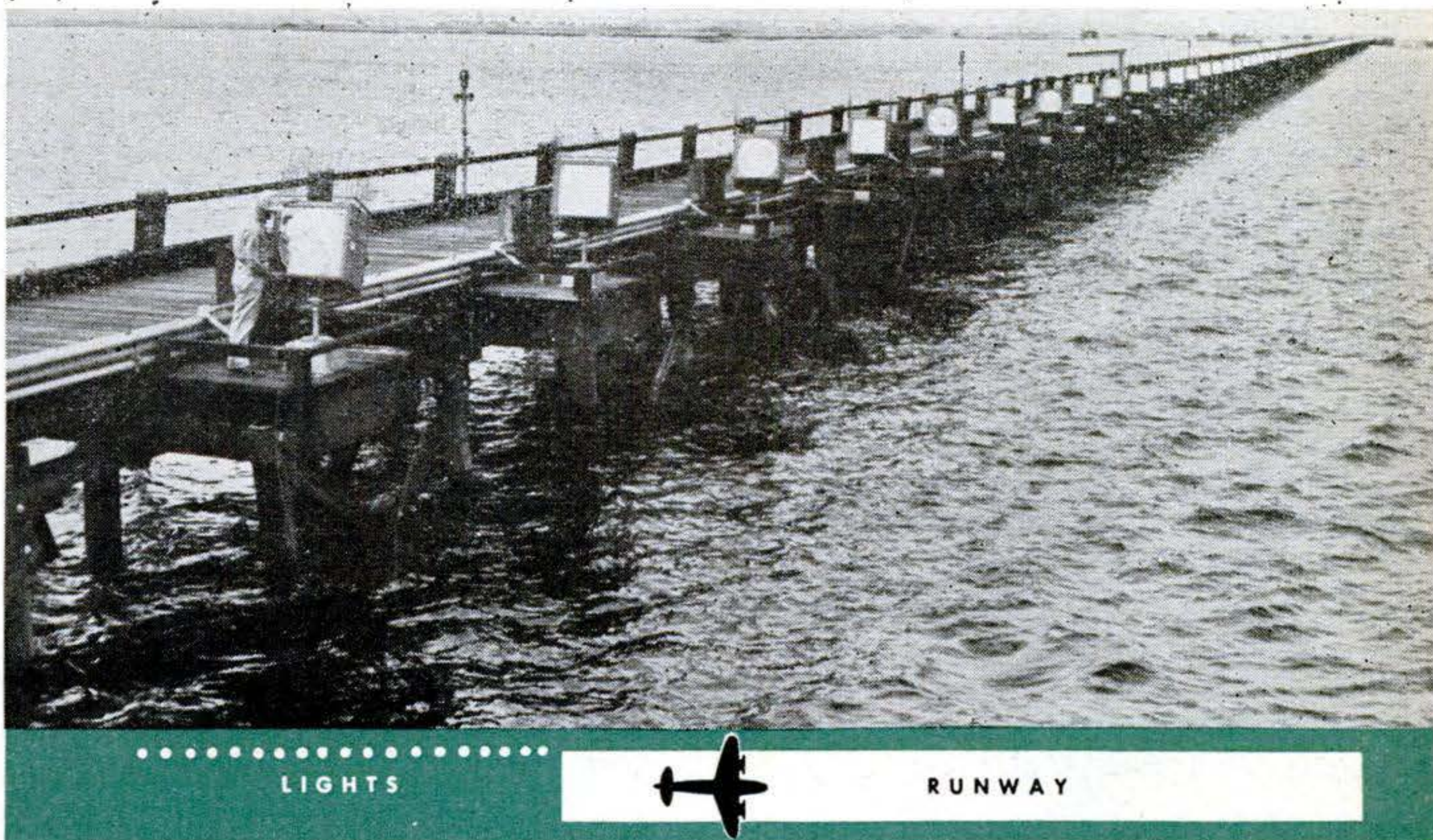
A little over a year and a half ago, Pennow was able to put a condensed version of the new lighting system to extended tests. He and his fellow engineers installed a six-light unit along the approach to one of the runways at Cleveland's Municipal Airport. On more than one occasion since, the short lightninglike streaks made by this experi-

mental installation have saved lives by guiding fog-bound fliers to safe landings.

At Arcata—a spot plagued by the worst fogs in the country—a full-size version of the approach-lighting system is now getting a thorough testing under the toughest conditions.

Mounted in special reflectors, each of the 35 krypton lamps in the system can give off a flash of $3\frac{1}{3}$ billion beam candle-power—equivalent, during its brief interval, to the light from 50 million 60-watt household bulbs and brighter than the brightest searchlight ever built. Arranged alternately with the 34 "blaze" neon lamps in a long line extending out from the end of the runway for two-thirds of a mile and fired in rapid succession 40 times a minute, the lamps create a brilliant animated pointer.

The krypton lamps are flashed at their full power only during conditions of zero-zero visibility. When the fog is light and there are no low clouds, so much man-made lightning would be wasteful and a nuisance. In clear weather, the krypton lamps can be stepped down in brilliance to as low as $1/3,300$ of their full flashing power. Or



The 35 krypton lamps, alternating with 34 neon "blaze" lamps, are mounted on a 2/3-mile-long pier stretching out into the water at the Idlewild Airport. Spikes on top of the box-

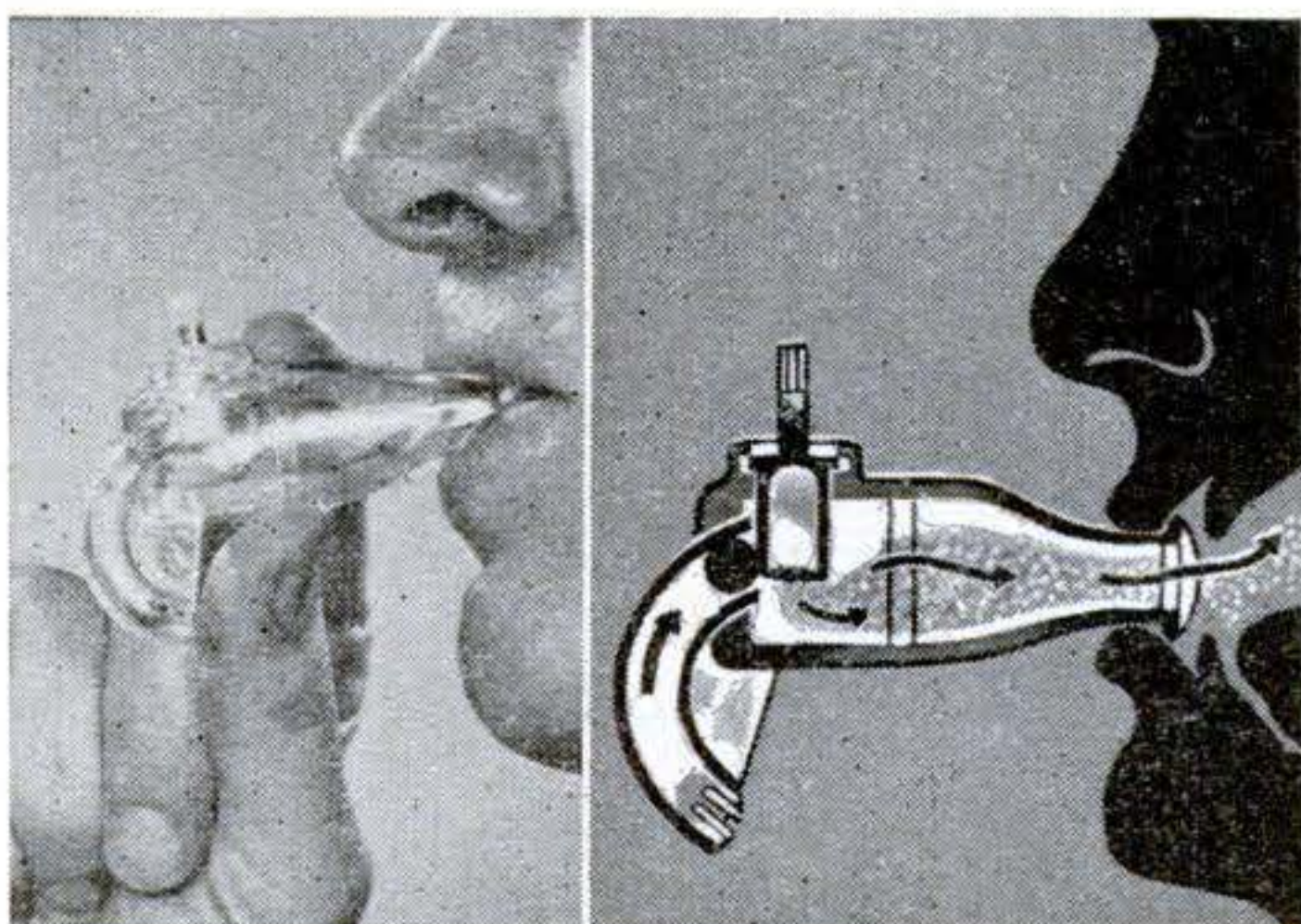
like lamp housings help keep birds away. Sketch shows how ribbon of lights, which flash on and off in rapid succession, leads storm-blinded pilots right to beginning of runway.

they can be turned off completely in favor of the less brilliant neon units, which can be used as flashing or steady-burning lights.

Not long ago, an Air Force C-54 transport plane developed engine trouble near Cleveland. The pilot, in touch with the Cleveland airport by radio, received the grim news that the ceiling there was little more than 300 feet. Nevertheless, he decided to attempt a landing. After three unsuccessful attempts to find the field, the pilot was on the verge of turning away to

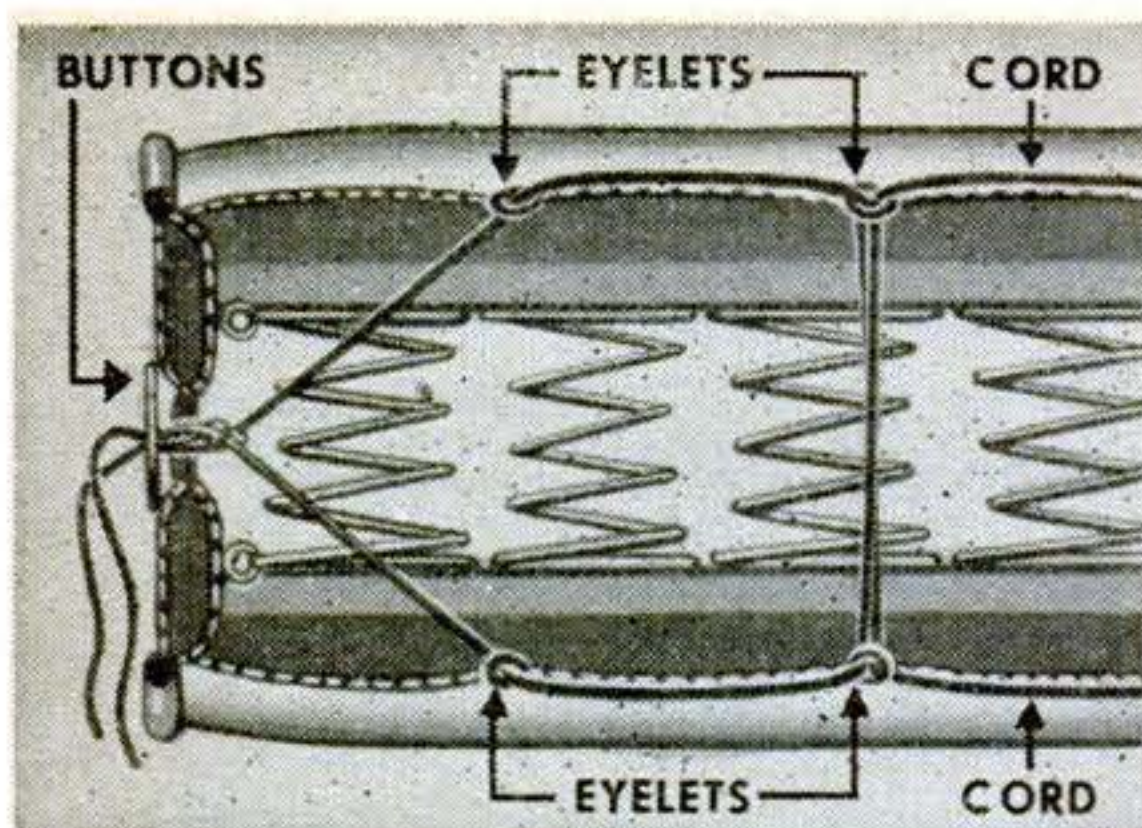
risk a search for better weather when the airport personnel turned on the field's instrument landing system and the Westinghouse experimental lights.

On his next try, the pilot followed the ILS signals toward the airport and then picked up the flashes of the six brilliant lights. Safely on the ground with his crew of seven and 32 passengers, he told observers that he "never would have made it" if it hadn't been for Bill Pennow's man-made lightning. END



Inhalator Kills Germs

You can inhale penicillin just as easily as pipe smoke with this clear-plastic Aero-halor[®]. Inhaling, as diagrammed at left, forces a tiny metal ball up a curved track until it strikes a sifter container filled with the powdered drug. This jars a small amount of the powder out of the sifter, and the air stream carries it into the nose, throat and lungs. Made by Abbott Laboratories for treatment of these areas, the inhalator has interchangeable nose- and mouthpieces.



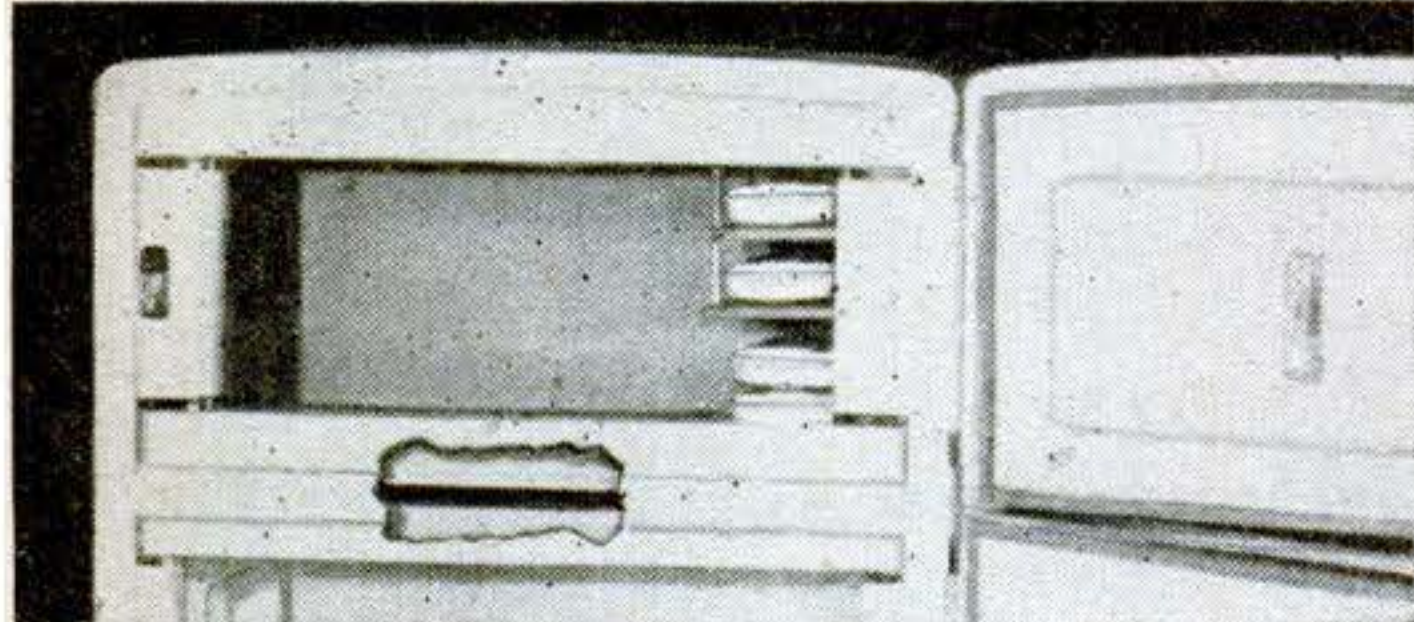
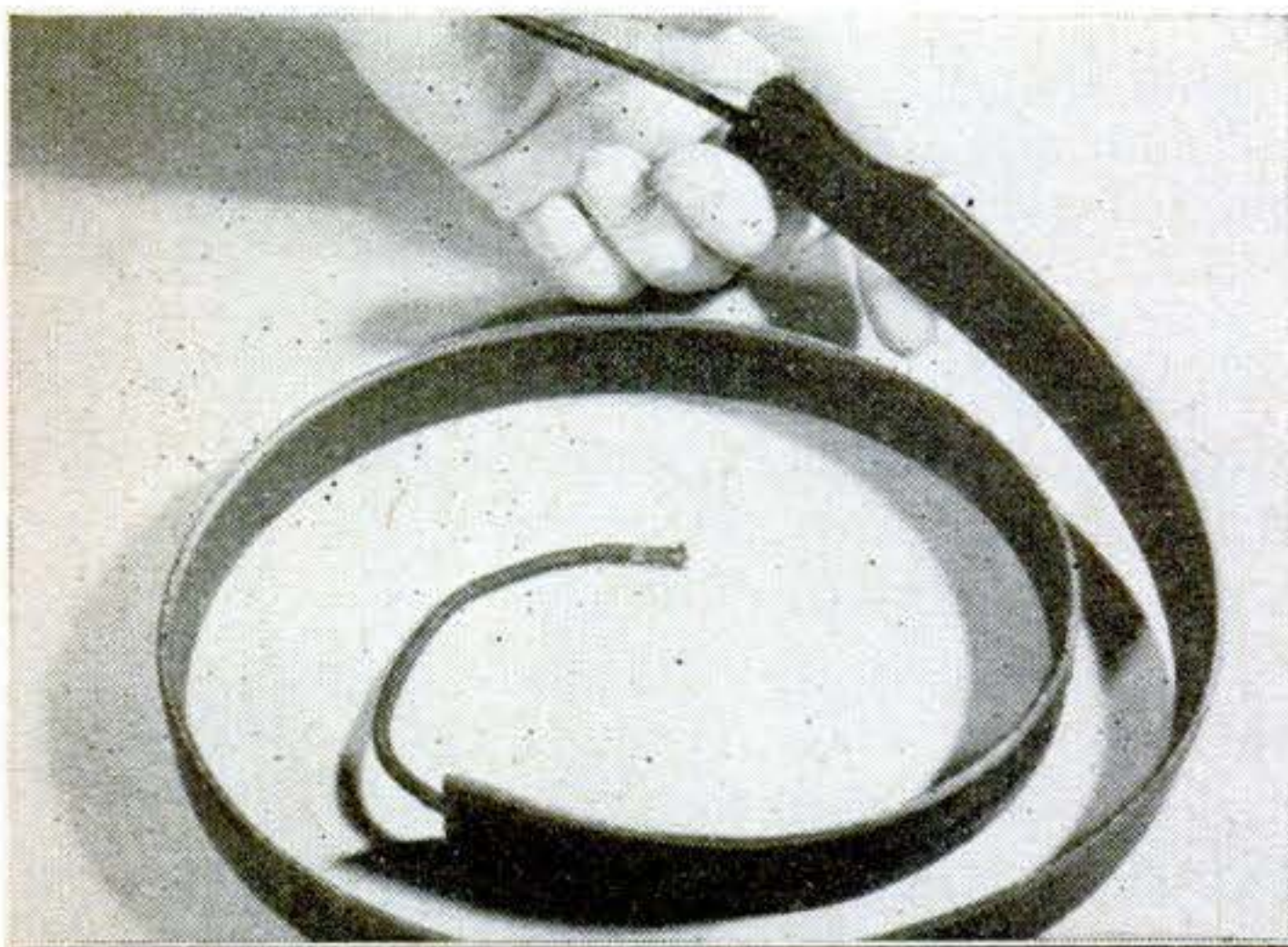
Cords, strung through eyelets in top and bottom of spring casing, are led out of mattress through large buttons, indicated by arrows at right. At desired tension, cords are wound around buttons to hold them tight.



Adjustable Mattress Tailors Bed to Sleeper

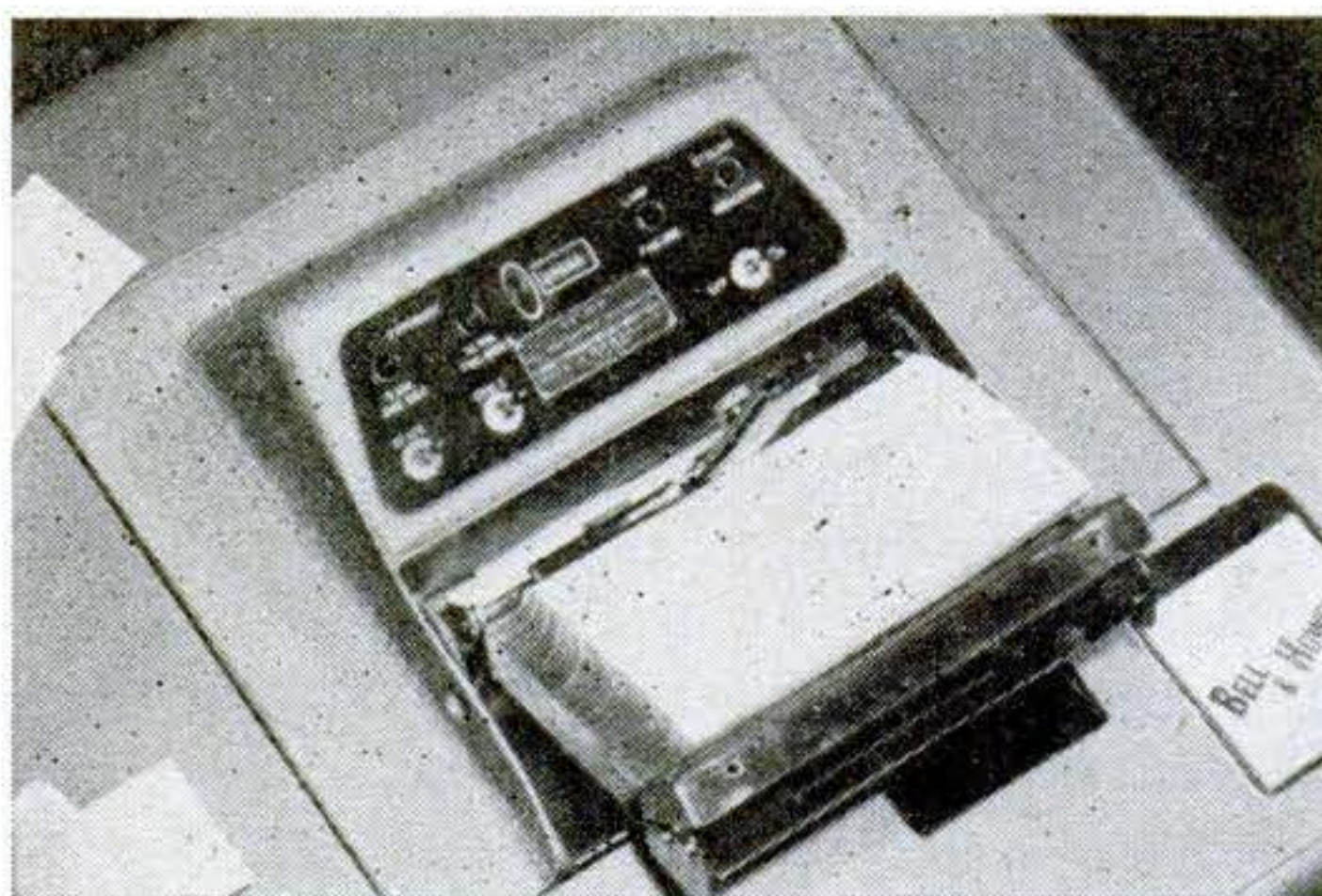
IF YOU like your half of the bed hard while your wife likes her side soft, you can both have your way with this new Sleep Selector® mattress. And if you like the head of the mattress firmer than the foot, or vice versa, you can arrange that, too.

Each half of the mattress has two sets of cords, one near the head and the other the foot, running through the spring casing and leading out openings in the side. Tightening the cords compresses the springs, increasing the firmness in each area as desired.



Freezer Gets Heater

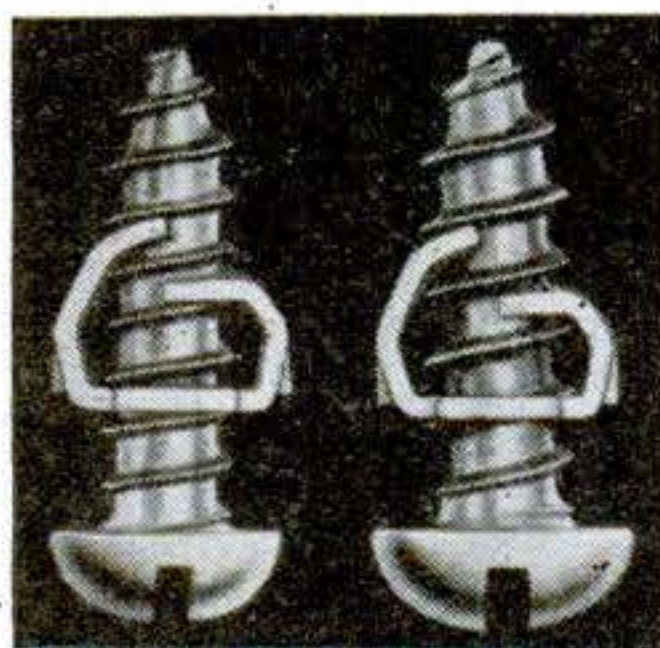
TO KEEP refrigerators from "sweating," U.S. Rubber has developed a heater that keeps the outside warm enough to prevent condensation without affecting the temperature inside. Simply a strip of electrically conducting rubber (top photo), it serves as a resistance element without wires. The cut-away (bottom photo) shows it installed.



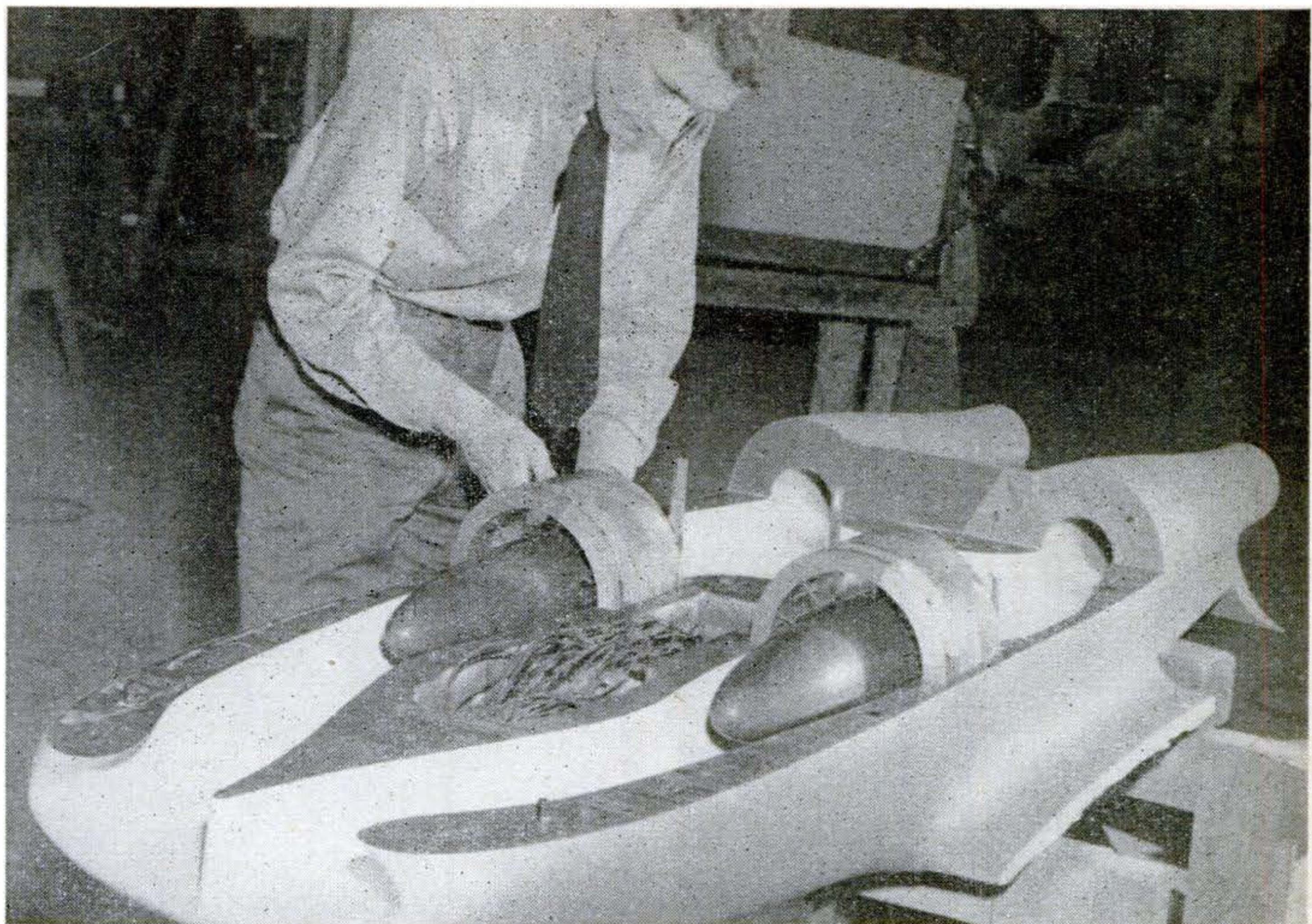
It's Done with Mirrors

A SYSTEM of mirrors lets this new Bell and Howell microfilm recorder photograph both sides of a document at once, placing them side by side on 16-mm. film. An automatic feeder runs 250 documents through a minute—twice as fast as in present recorders.

Nut Locks on Screw



IF YOU can't reach behind a panel to put on a nut, just push through a Snap Nut®. Screws, No. 8 or 10, spread it apart, locking both screw and nut in place.



This large, precision test model of a twin-jet nacelle may point way to bombers of the future.

Aero Lab Is Craftsman's Dream

ON THE tidal flatlands south of San Francisco is a laboratory equipped like a workshopper's heaven. Here, wood and metal are worked with a precision that even a watchmaker would consider finicky. Here, the craftsman is king.

The Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics, at Moffett Field, Calif., has the tools to do this kind of work. It has to have. For this laboratory creates model airplanes and parts for the delicate tests that tell engineers how real planes—long before they are ever built—will perform.

The models, accurately scaled with precise skill, are put into wind tunnels and battered with man-made hurricanes of speeds from a few hundred miles an hour to those far beyond that of sound. Some of the designs tested will never get off the ground. Others, surviving the smash of repeated trials, will turn up in airplanes in the months and years to come.

Many kinds of materials are used in the Ames model-building laboratory-workshop. The pin-point noses of fuselages are sometimes made of plastic. Wings are occasionally machined from solid steel. Tough Central American mahogany is an old shop stand-by. Often wood, easily contoured, is built around a steel framework for strength.

The laboratory's super-workshoppers meet problems that the average model maker never encounters. Yards and yards of tiny copper tubing, for instance, must be embedded in the models to record vital air-flow information. Wing edges must be ground razor-sharp to explore the mysteries of supersonic flight. To come as close as possible to the real thing, some models are built large—only a few times smaller than the huge, full-scale planes they represent.

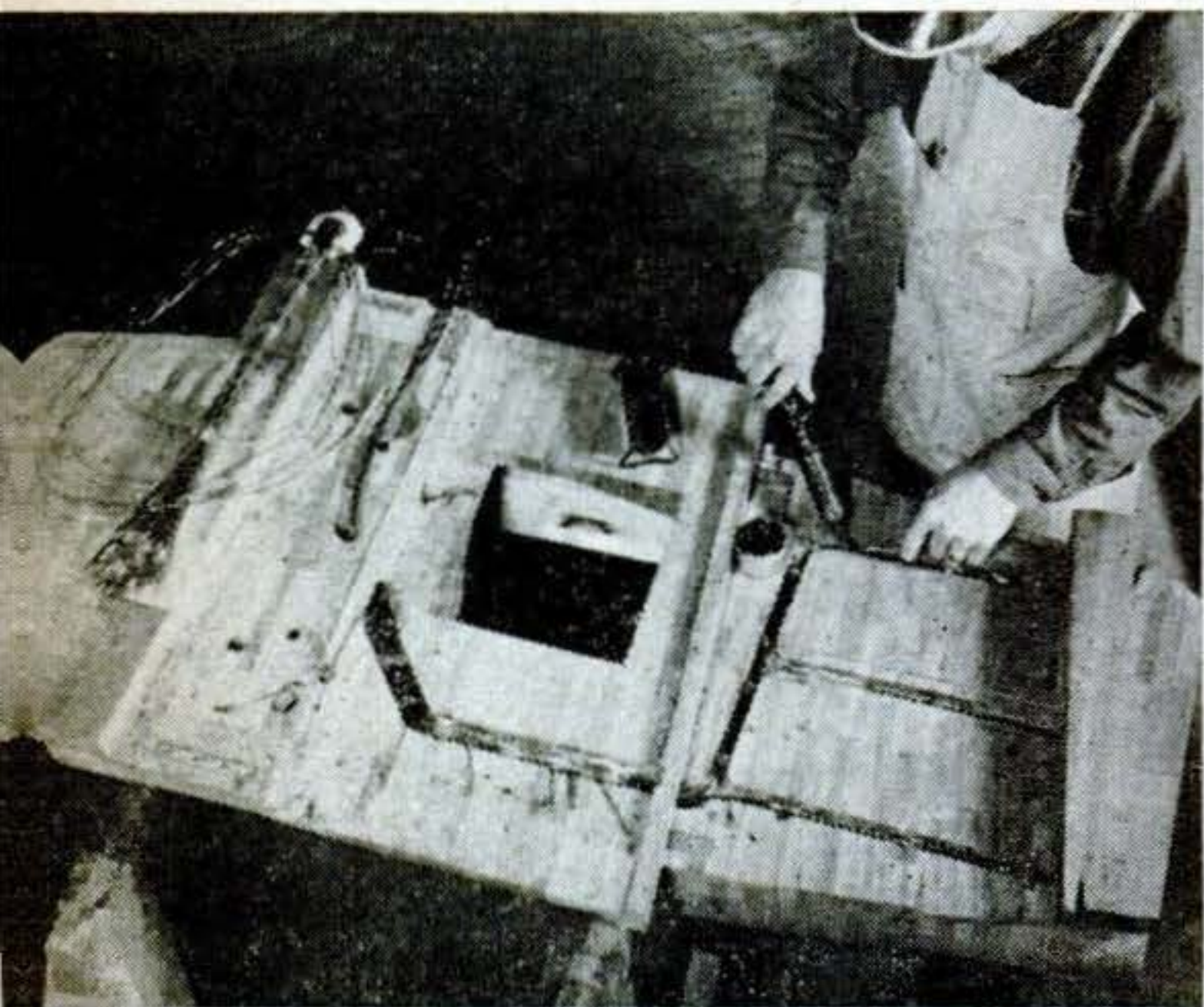
On the following pages is pictured the birth in model form of an engine nacelle for a new jet bomber—from its conception in clay to its wind-tunnel baptism.



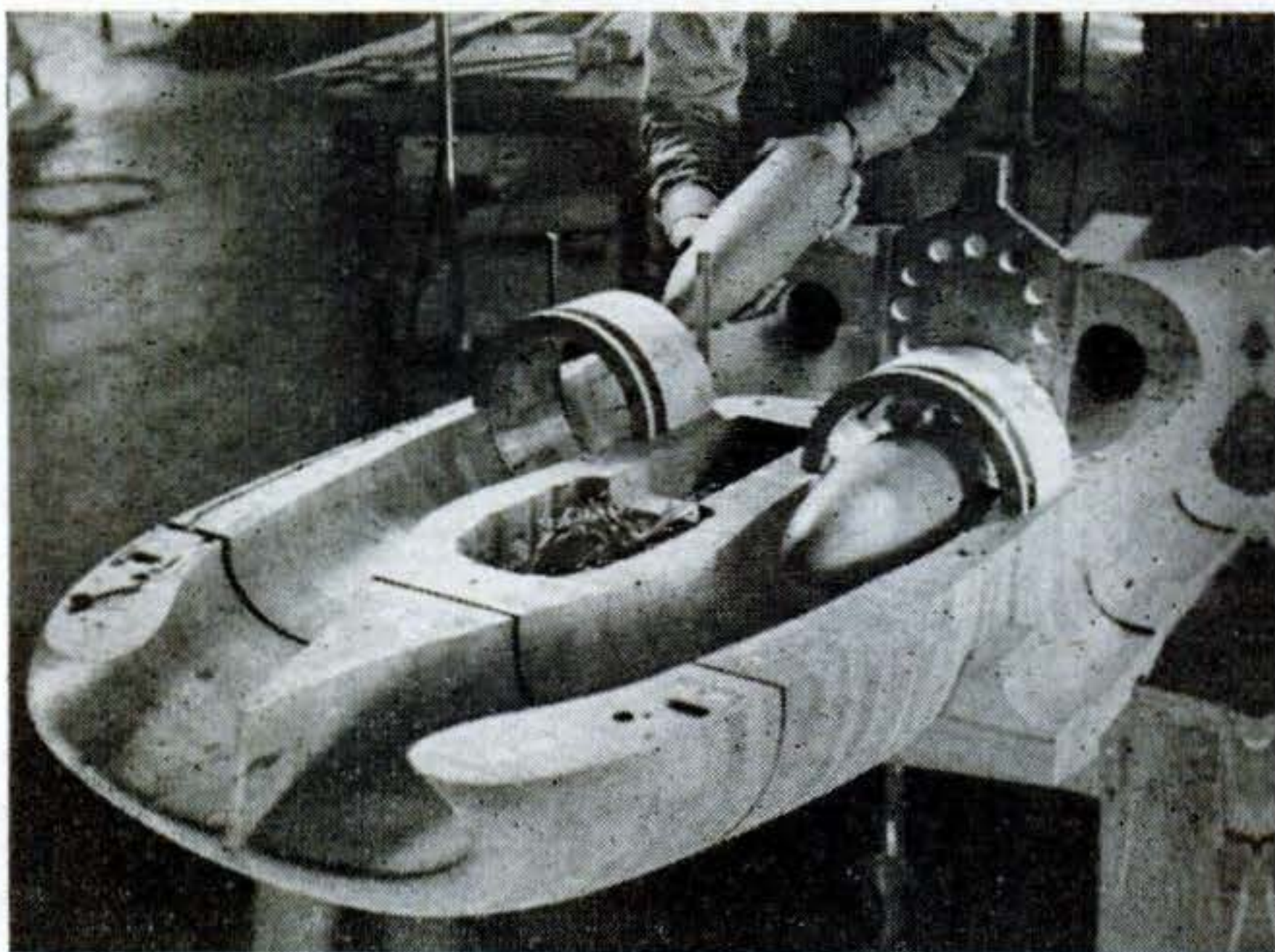
Design of new bomber begins with test model of one of its twin-jet nacelles. Here templates are checked with vernier gauge. Accurate to .002 inch, they will guide shaping of model.



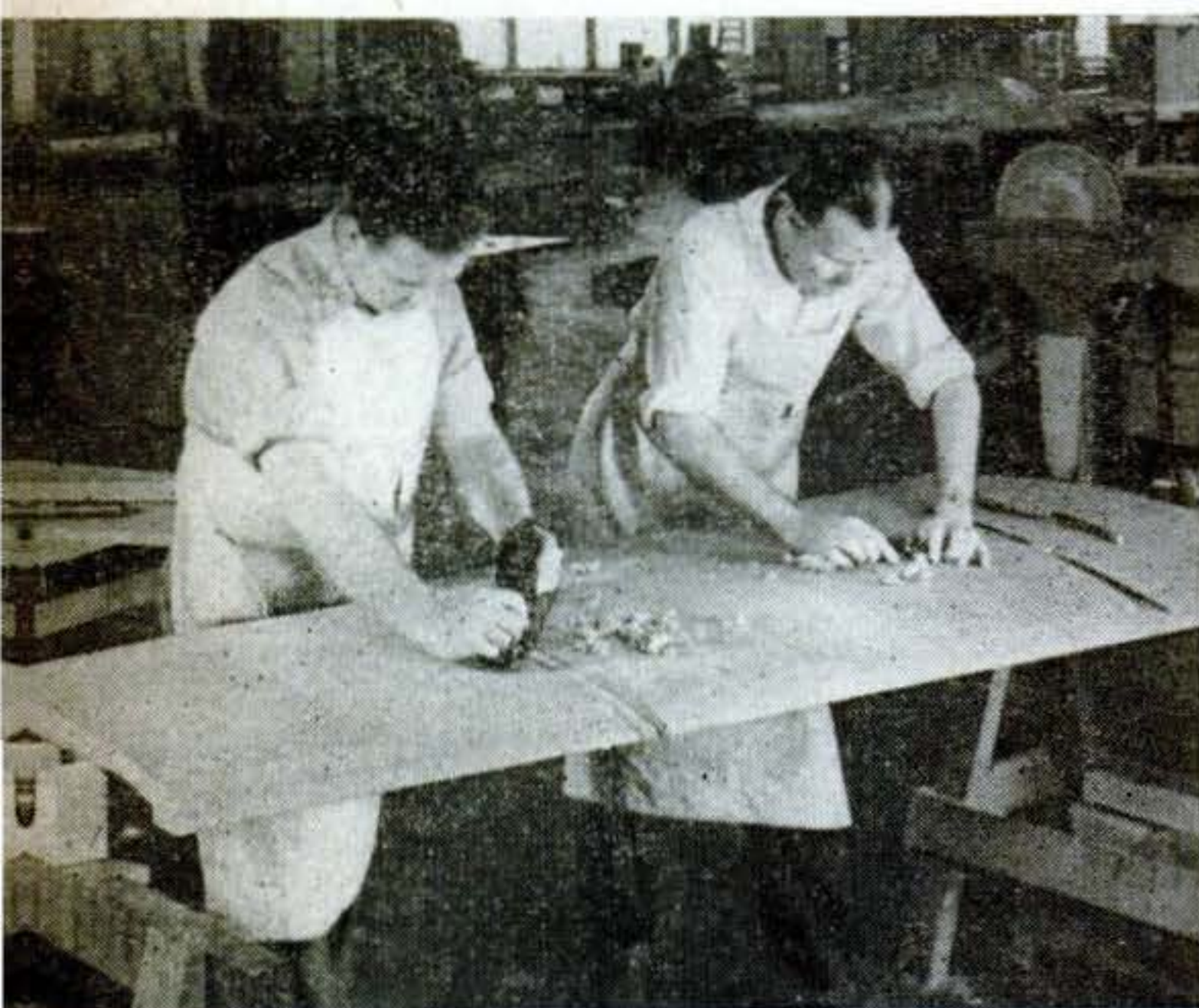
Finishing touches are put on preliminary clay mockup of nacelle from which larger, wood-and-metal model is made. Nacelle will be tested by itself and as part of complete model bomber.



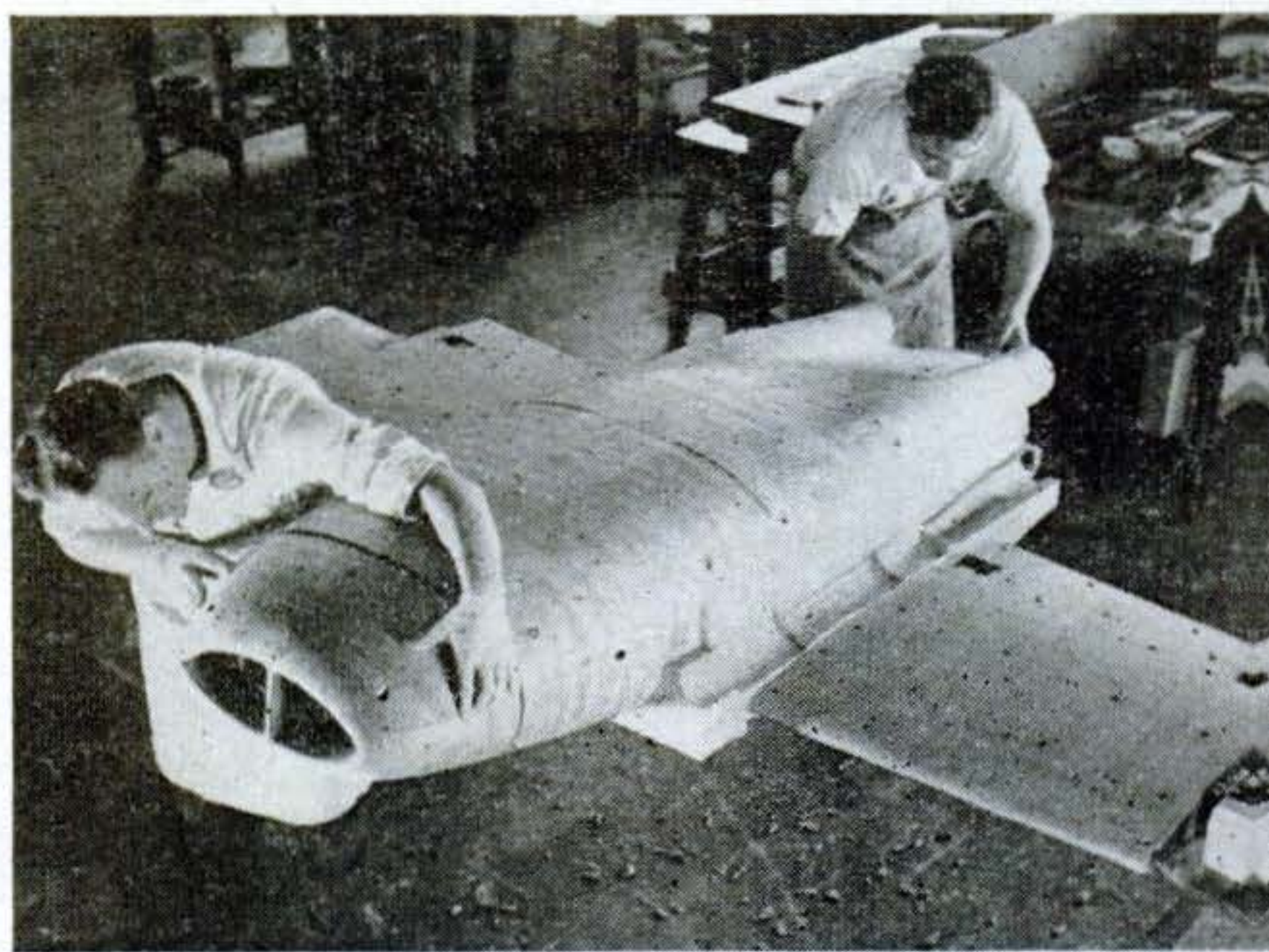
Nacelle's underside is maze of pressure tubes. Each one must be soldered in place to keep it from jarring loose. Tubes lead out of model through wing to manometers outside tunnel.



Inside nacelle, bulletlike objects representing parts of twin jet engines are installed in jet tubes to simulate internal air-flow conditions. Nacelle model is about one-fifth actual size.



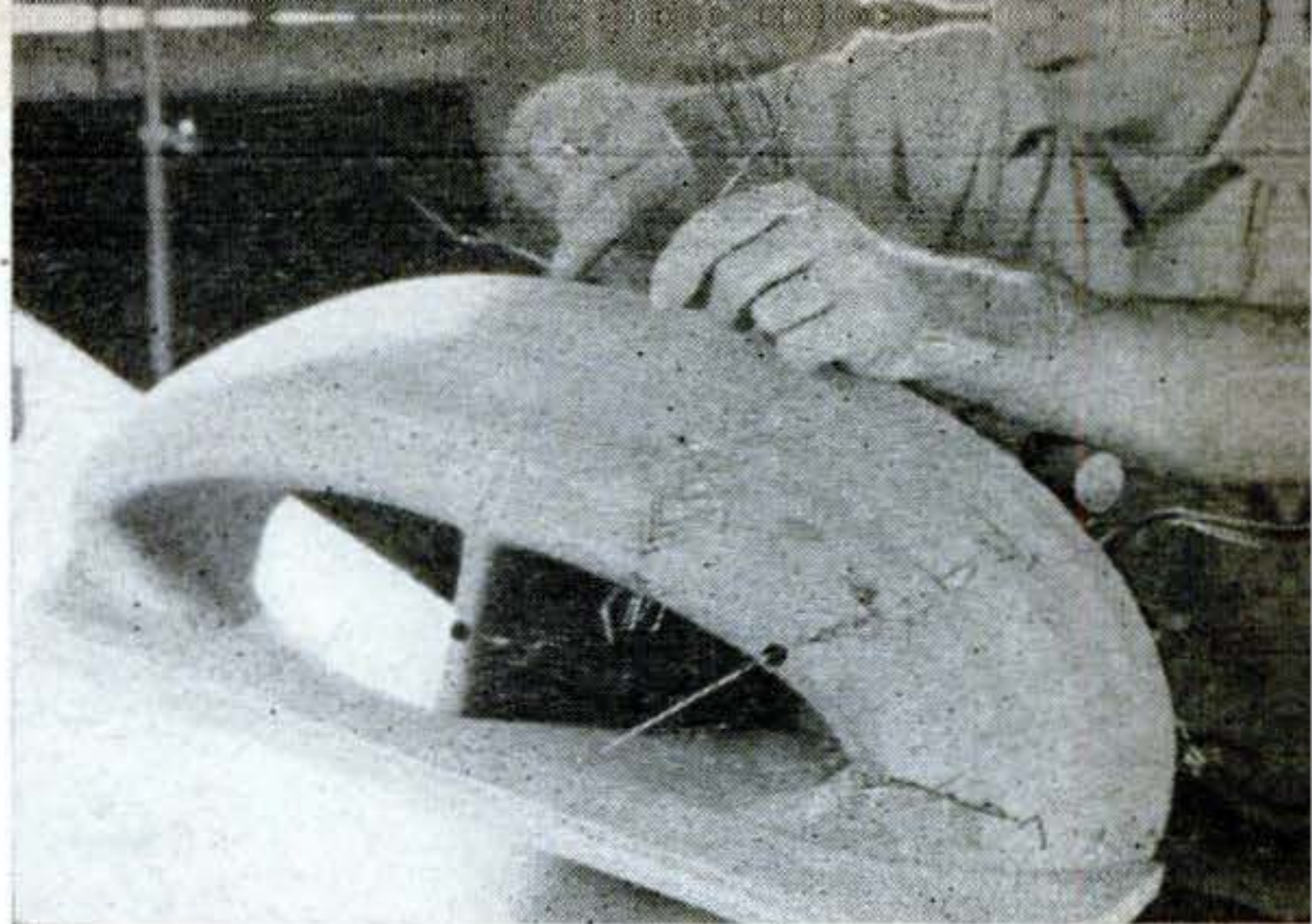
After wing is shaped by router, rough spots are planed smooth by hand. Delicate sanding completes the job. Such wood-and-steel models are stronger and more accurate than real wings.



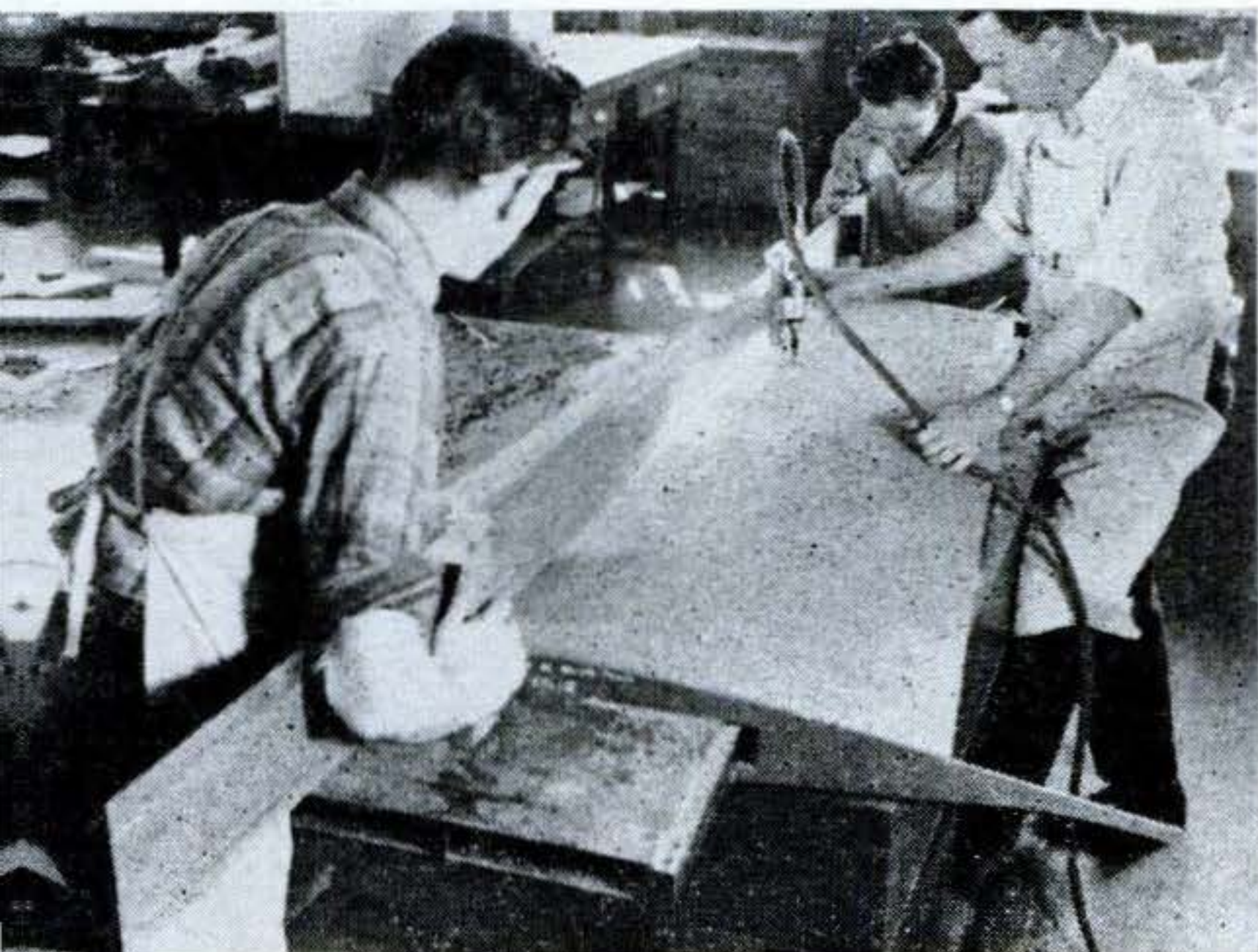
Nacelle body, made in several sections, is assembled and then fitted to one-piece wing section. Fillets between wing and nacelle are hand-carved and sanded to make smooth fairing.



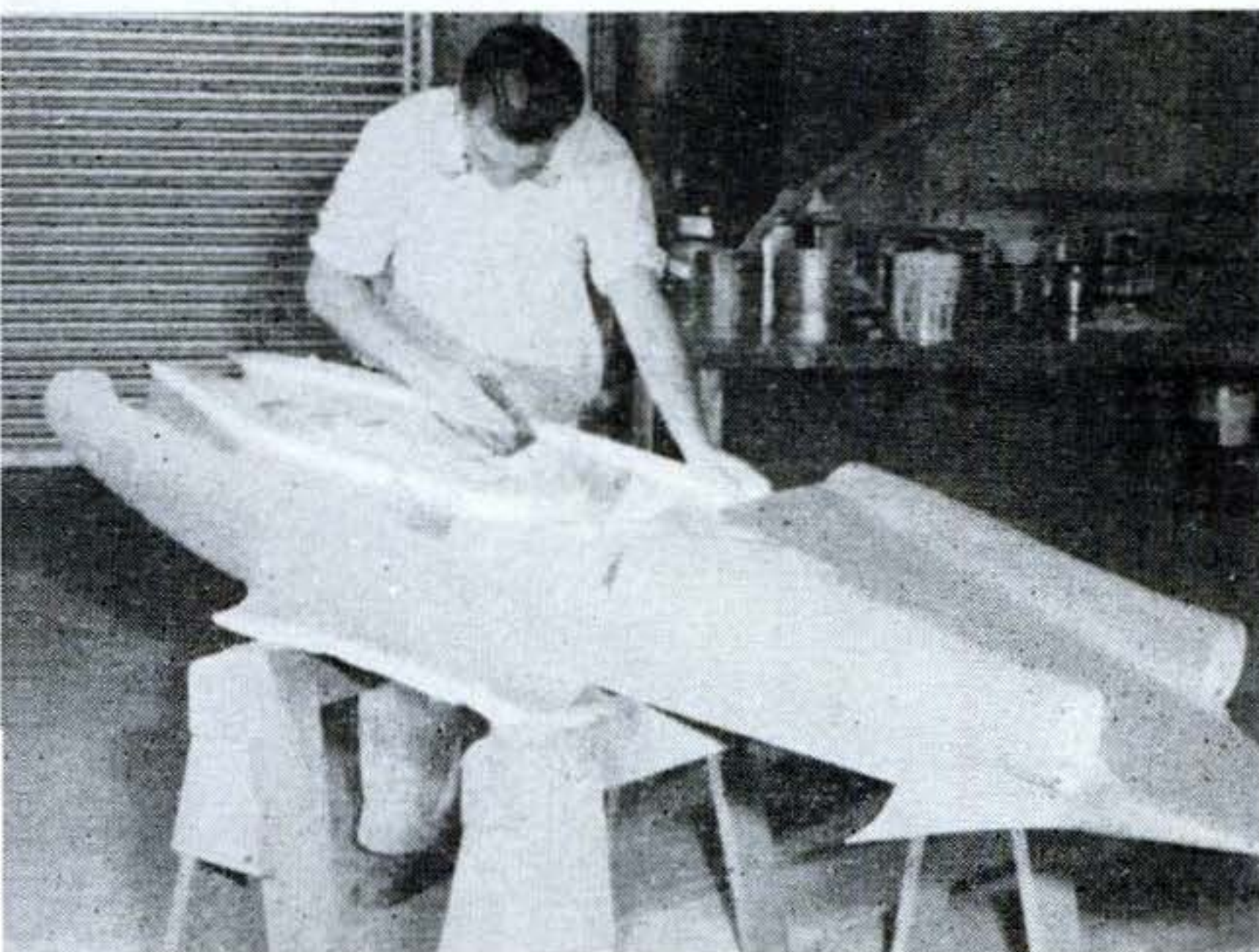
Nacelle body is built up of sections of tough Honduras mahogany, combining structural strength with ease of shaping. Sections are contoured with templates and then glued.



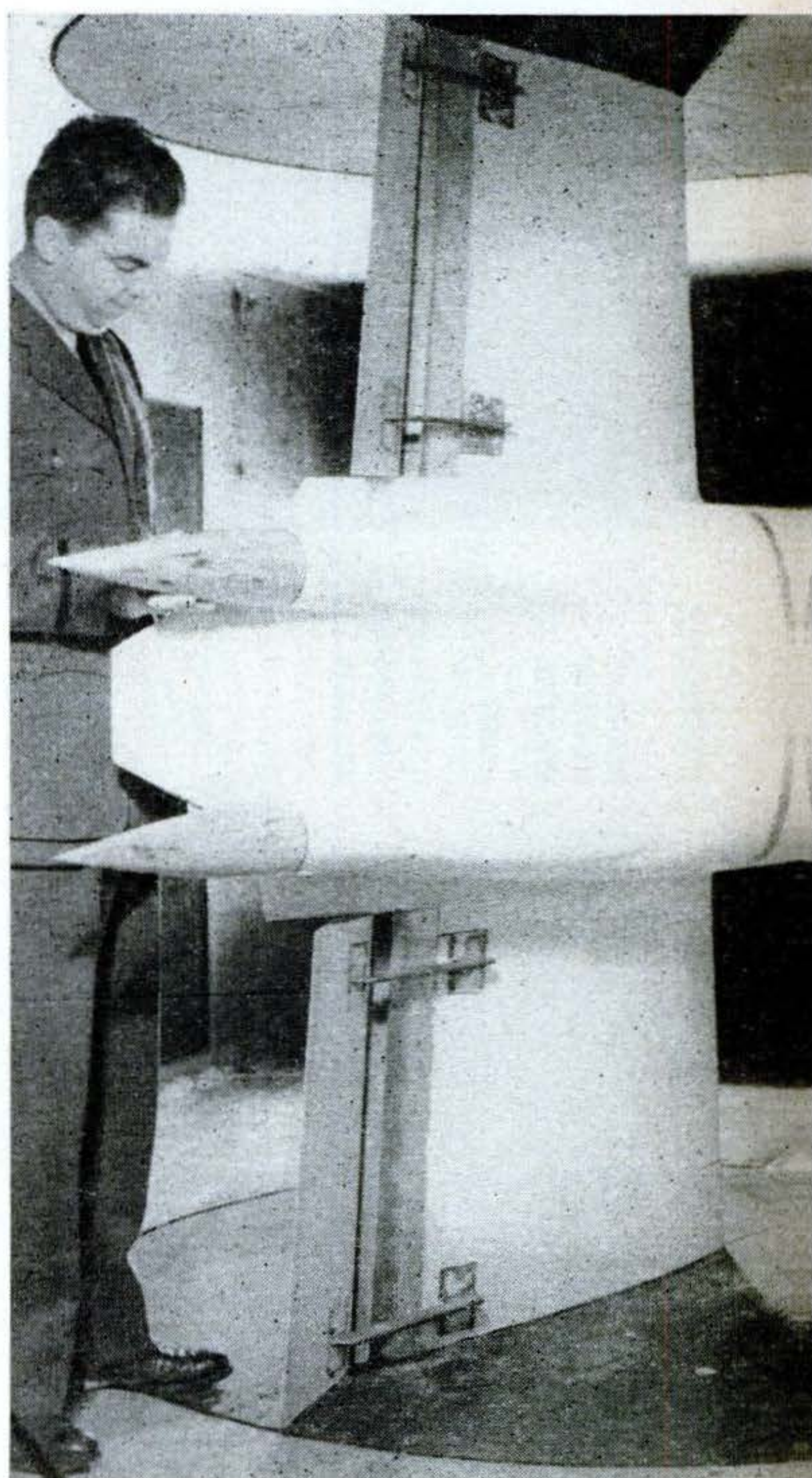
Air flow in and around nacelle will be recorded by tiny copper tubes embedded in model's surface. Pressure at 600 different points is indicated by displacement of mercury in glass tubes.



Nacelle's wing section is made of mahogany fastened to heavy steel spar. Surface is shaped by air-driven router riding on track. Templates at ends insure correct thickness and contour.



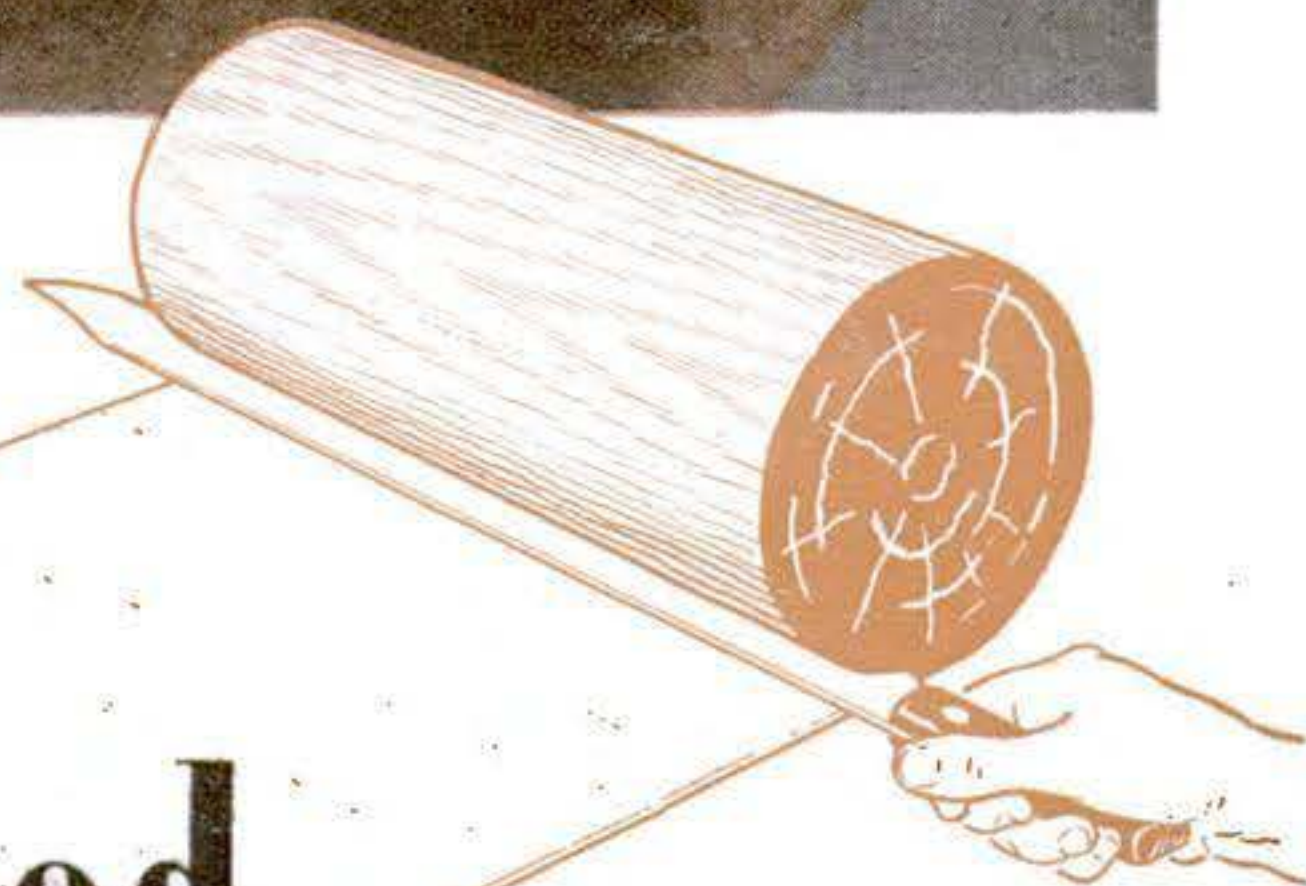
Five coats of lacquer give model hard, mirror-like finish. Each coat must be sanded smooth before next is applied. Most models are painted light gray so they will show up well in pictures.



In high-velocity wind tunnel, completed test model is mounted sideways between turntables in floor and ceiling. As air streaks past, plane will be rotated to simulate climbs and dives.



Unrolling Logs for Plywood



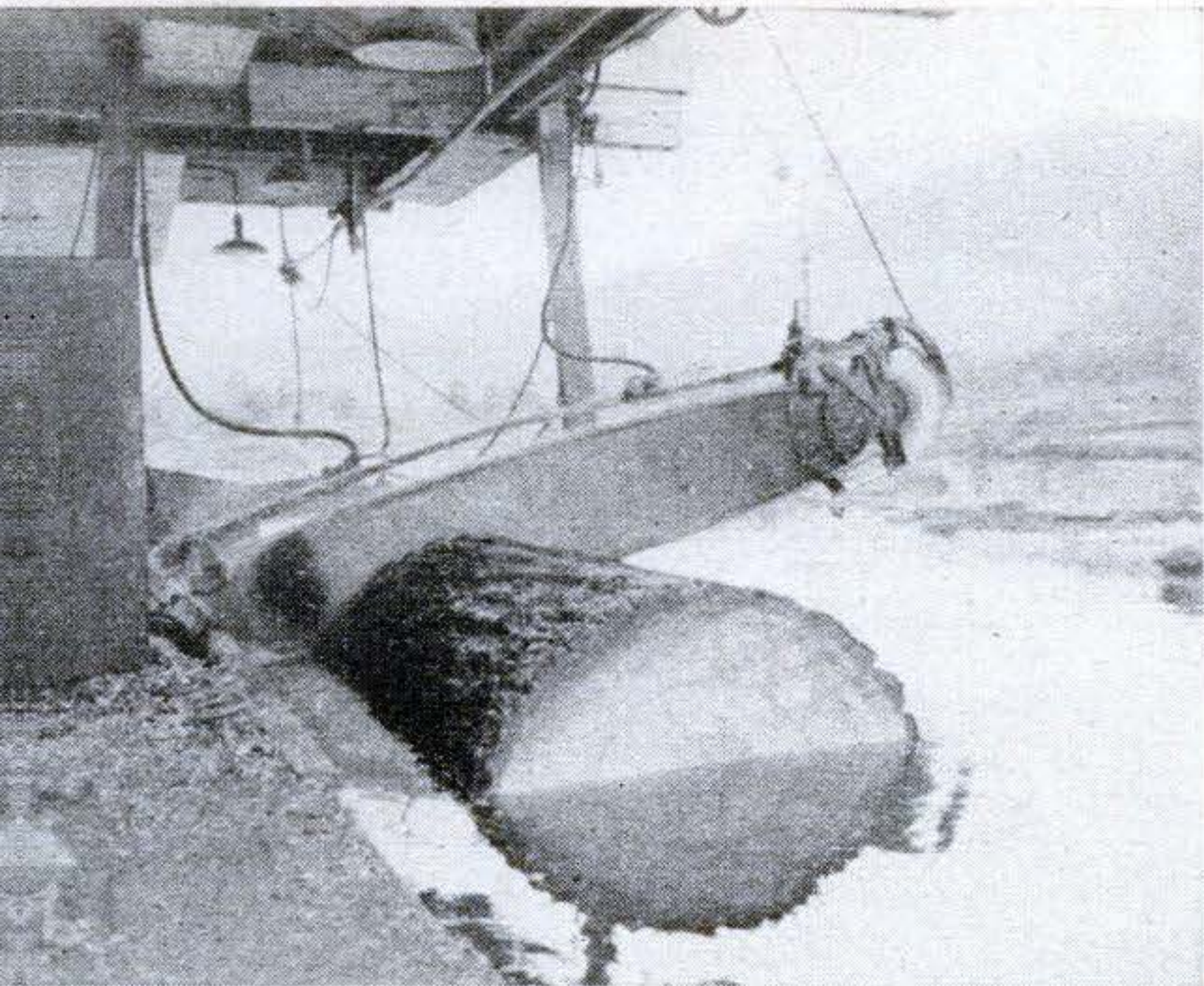
By Thomas E. Riley

THE ancient Egyptians made the first plywood from thin, wide boards sawed laboriously by hand from the center sections of large logs. Now most plywood veneers are cut by big rotary peelers that literally unwind a log like a roll of wrapping paper.

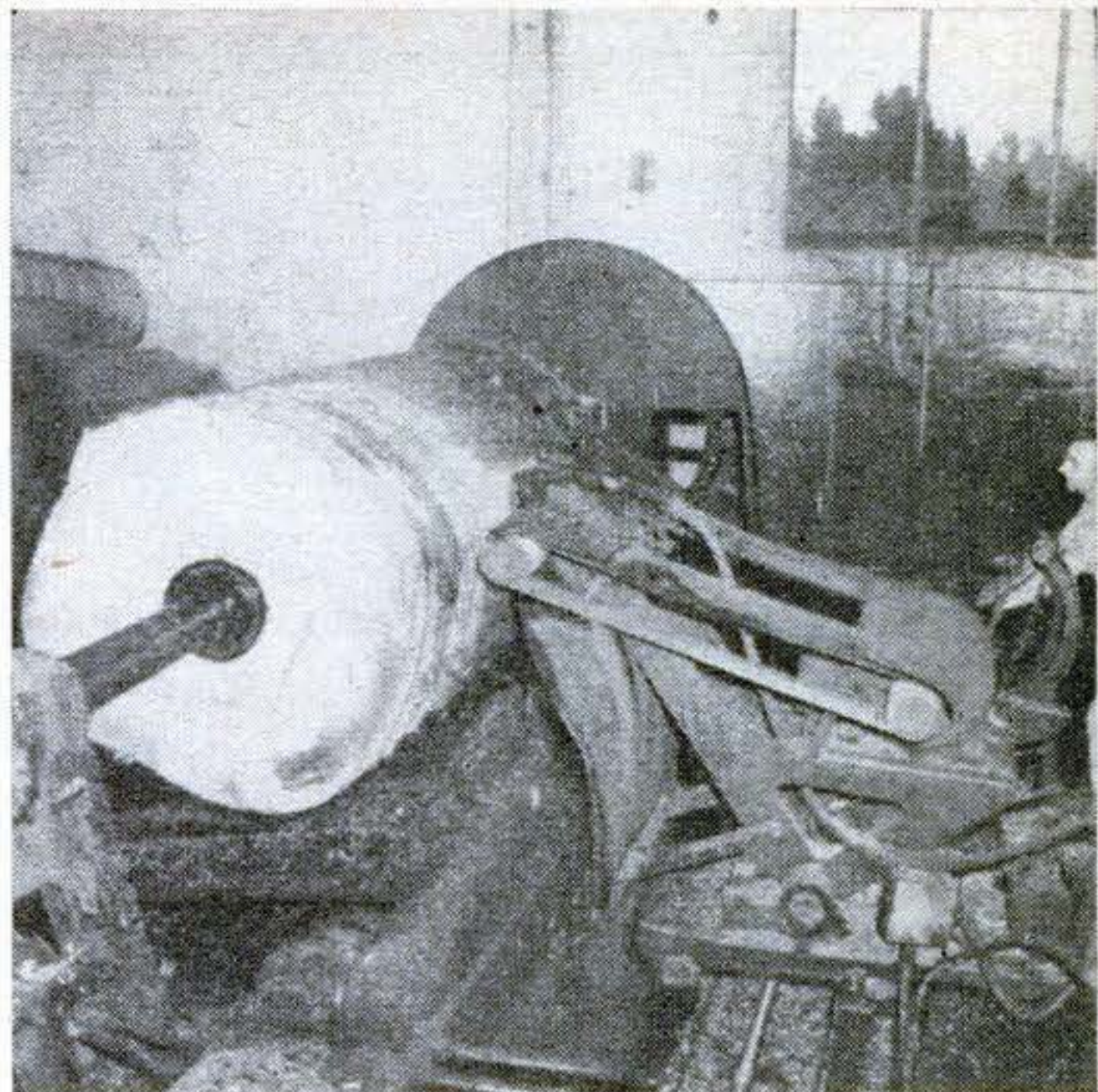
Basically, plywood is a layercake of lumber and glue, with three, five, or seven layers of veneer. Douglas fir peels best, is used in 96 percent of all softwood plywood.

The backbone of modern plywood is its glue. Ordinary interior plywood uses a casein or soybean-base glue. Exterior plywood uses a phenolic-resin glue that forms a waterproof bond stronger than the wood itself.

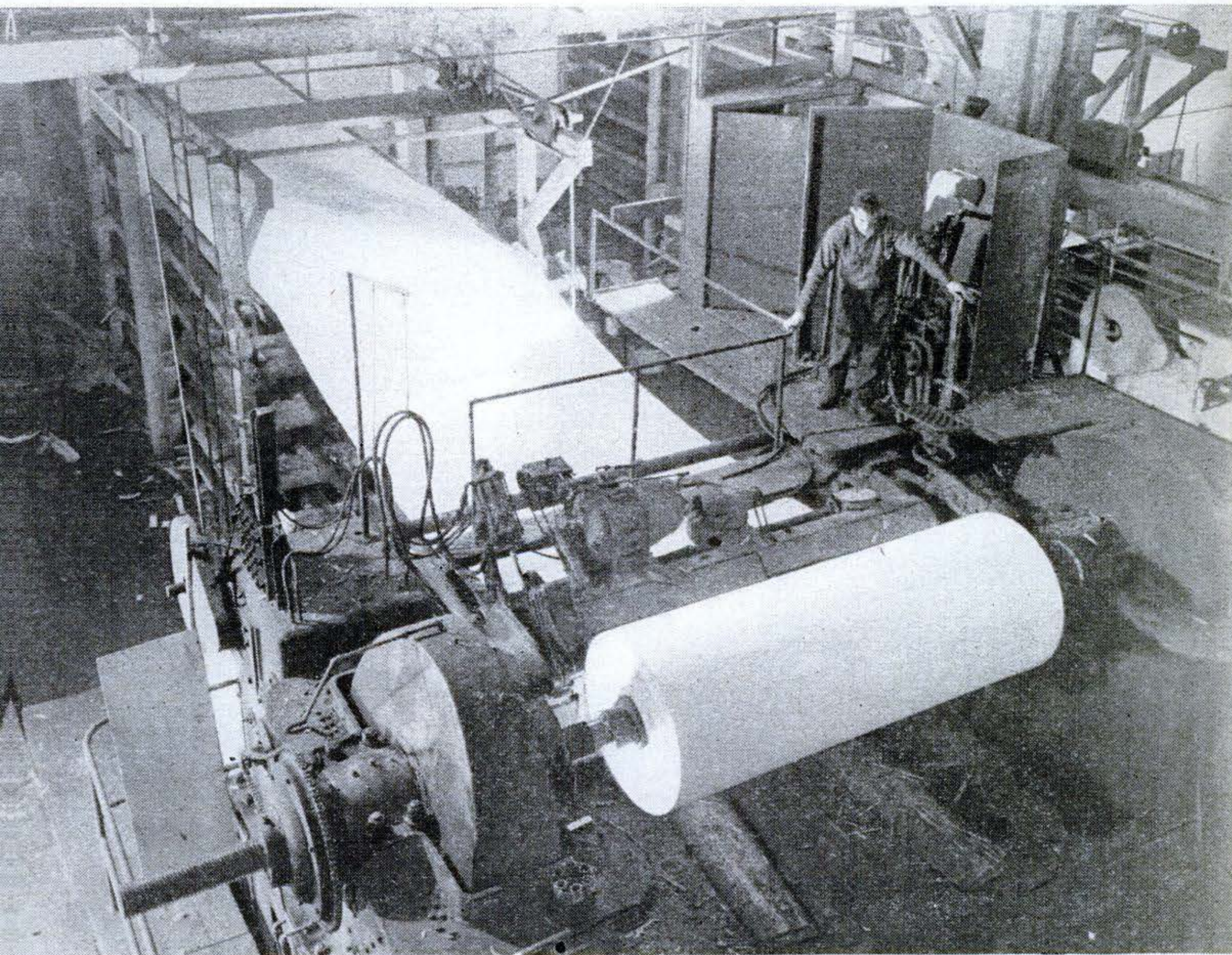
In huge, modern mills like the Cascades plant at Lebanon, Oregon, where these pictures were made, America is rolling out 2.1 billion square feet of plywood a year—enough to encircle the equator in a continuous strip nearly 16 feet wide.



1 Barge-mounted chain saw slices peeler logs into 6-, 8-, and 10-foot lengths. Operator's skill makes cuts come out even with logs' length. Log above is average size, about 4 feet thick.

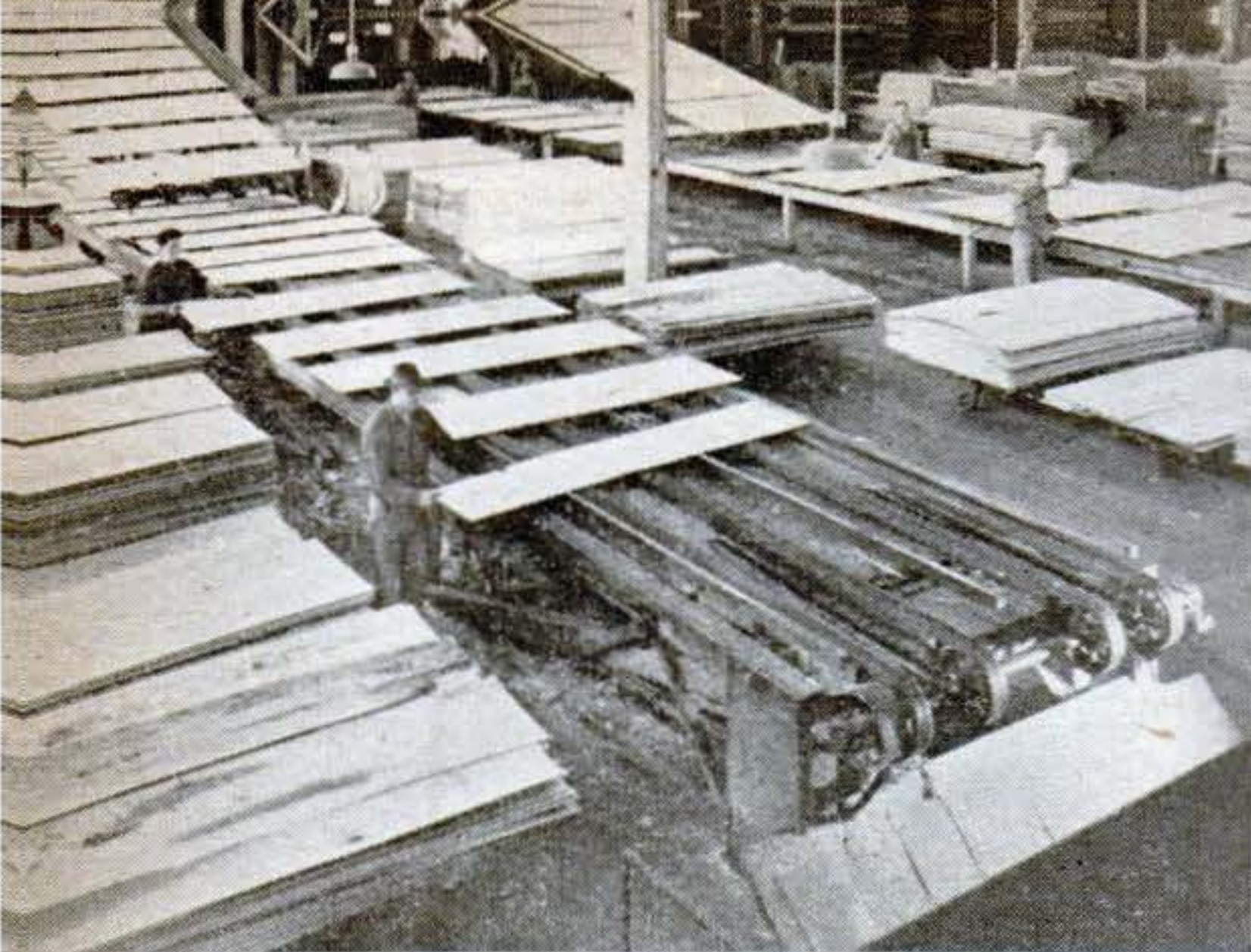


2 On heavy "barker lathe," log is turned slowly while whirling toothed wheel, moving back and forth, chews off bark and outer, unusable sapwood like you'd eat corn on the cob.

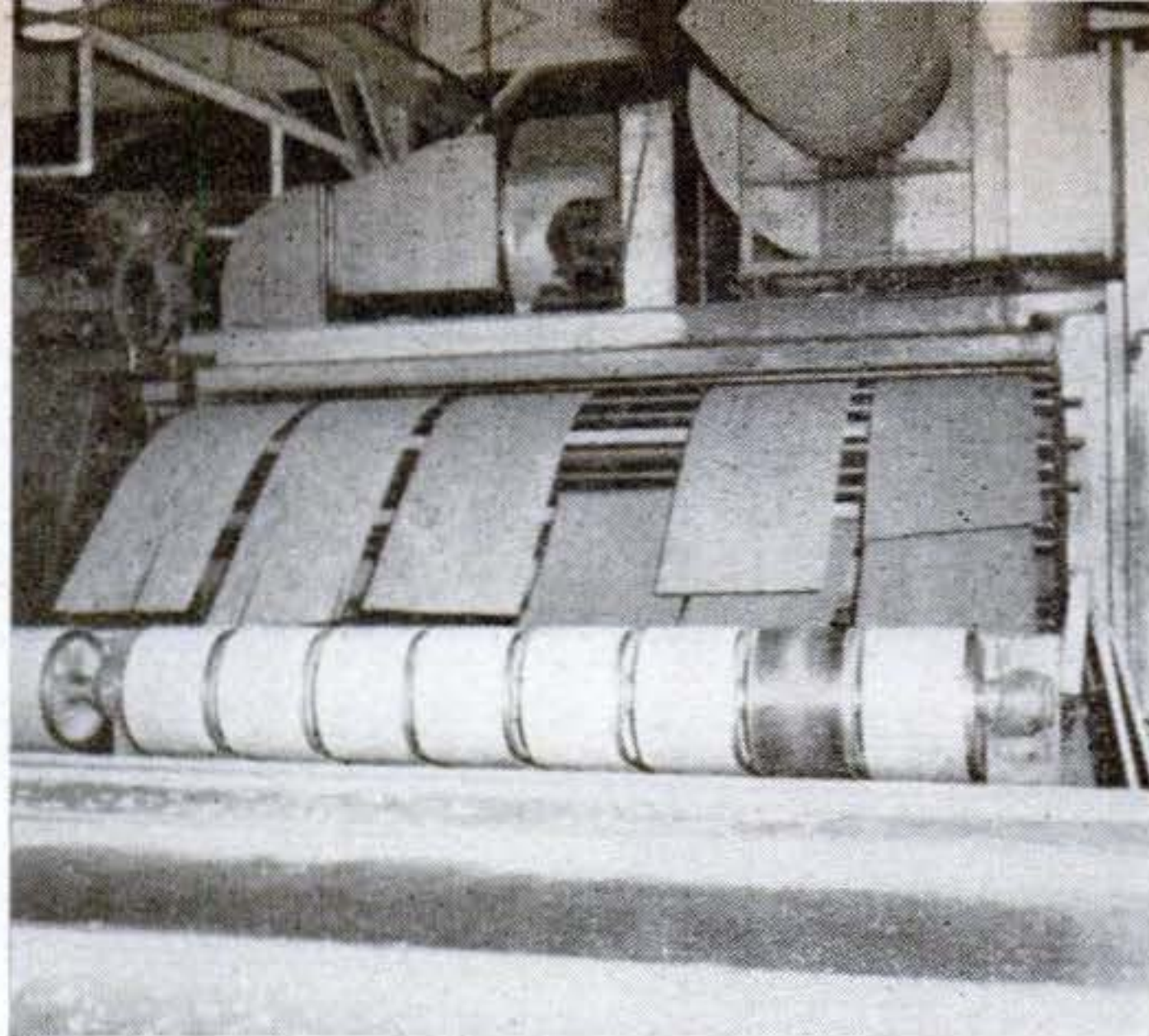


3 Peeling log looks simple, is actually complex. Giant steam-operated "peeler lathe" keeps log spinning evenly against long knife

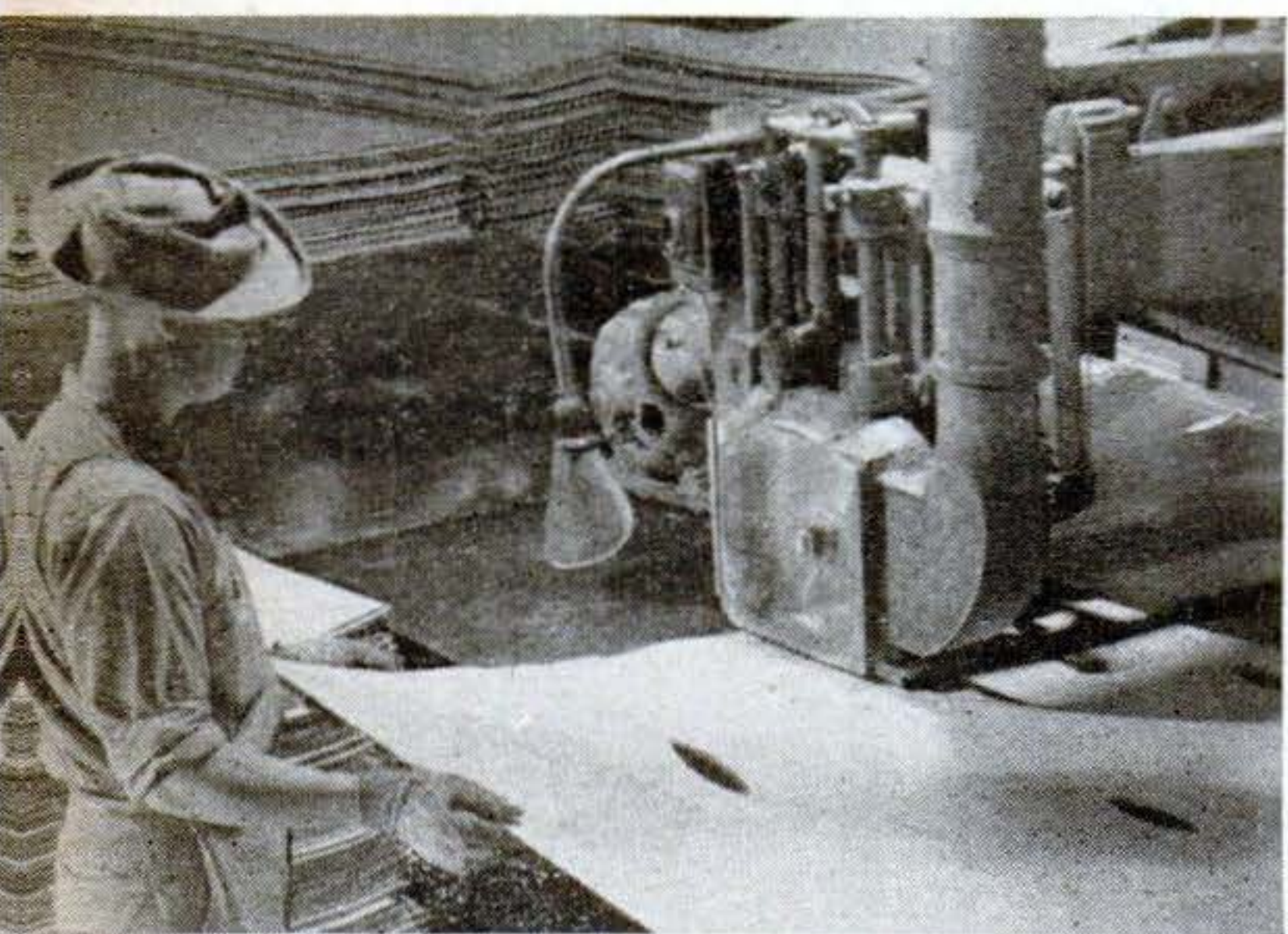
that slices off veneer in continuous strip only $\frac{1}{8}$ or $\frac{1}{10}$ of an inch thick. Water bath softens log's surface just before it reaches knife.



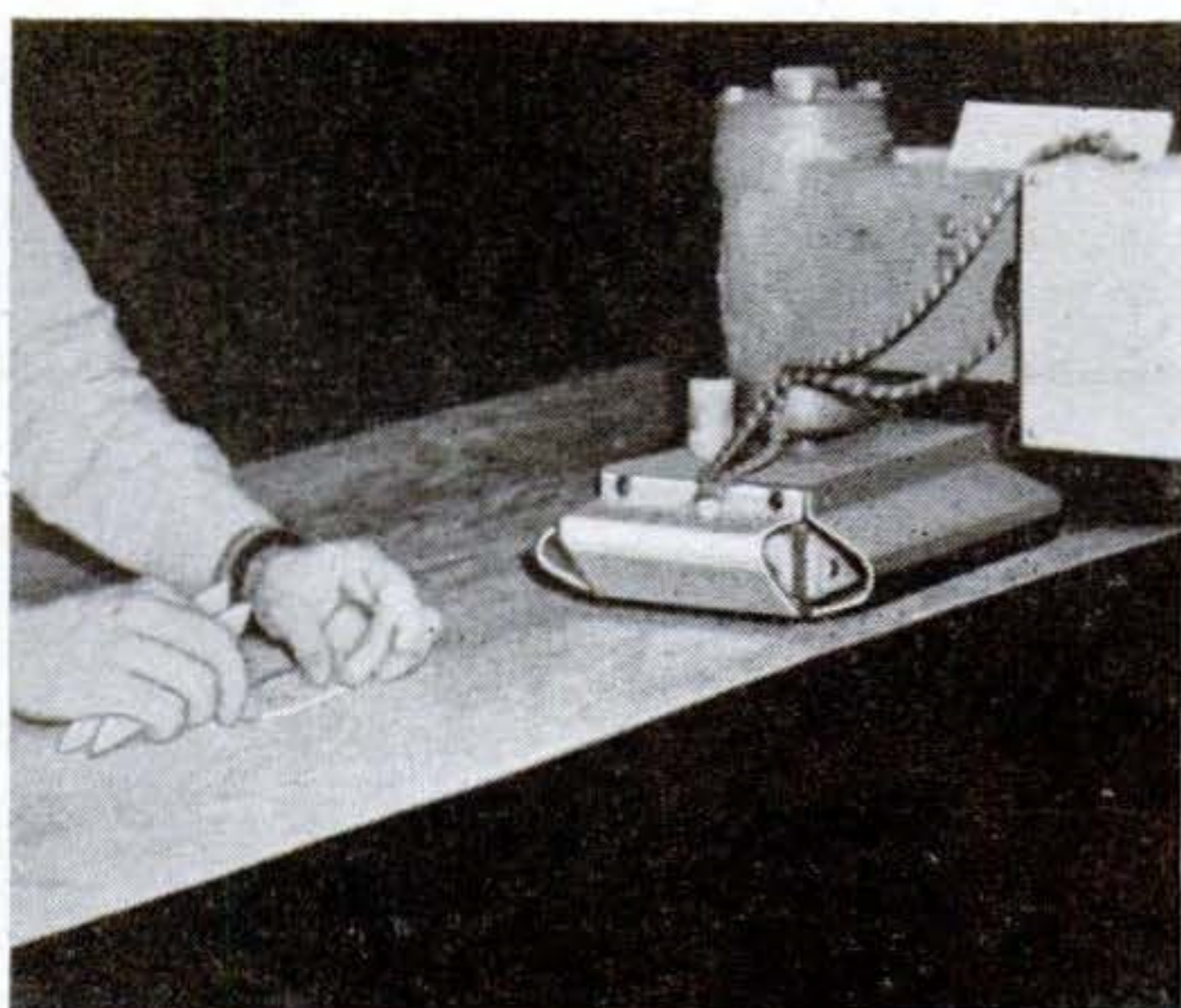
4 Freshly peeled veneer is cut into desired widths as it leaves lathe. Note narrow strips in foreground, wider in rear. Ragged, defective pieces, called "fishtails," are discarded.



5 A 15-minute trip through huge driers reduces moisture in the damp veneer sheets to 2 or 3 percent. Temperature inside reaches 350° F.—just 5° short of wood's burning point.



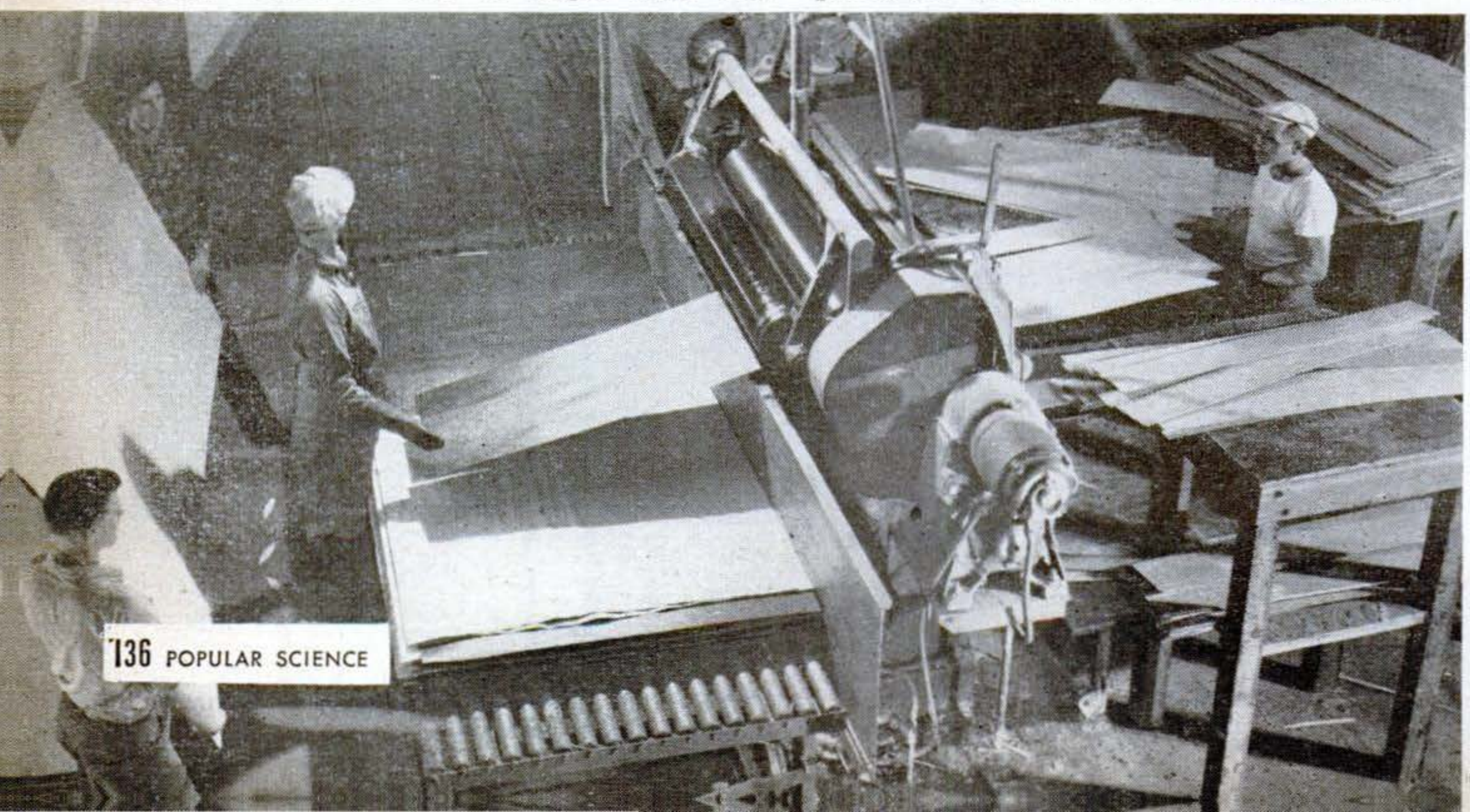
6 "Boat patchers" stamp out small boat-shaped sections where knots and blemishes mar veneer. Others, called "cookie patches," remove larger defects with circular cutouts.



7 Boat-shaped patches, made from good parts of rejected "fishtails," are cemented into holes in veneer under heat and pressure of bonding machine that looks like an oversized flatiron.

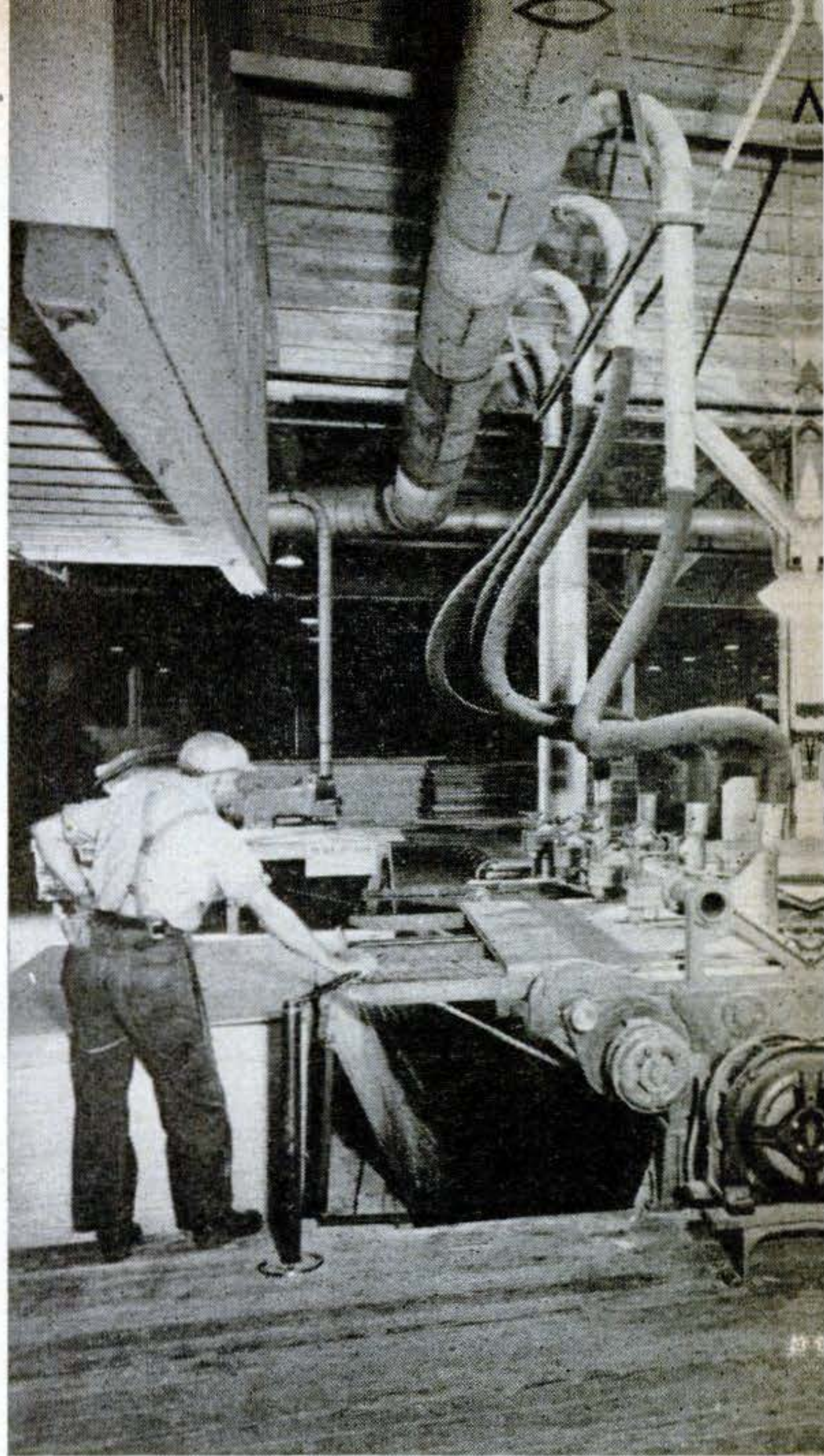
8 Rollers spread glue on both sides of core sections as assembly of 3-ply, 1/4-in. plywood begins. These are laid on larger sheet that

forms bottom of panel. Then two more large sheets are placed on top, one to complete the panel, the other to start off the next one.





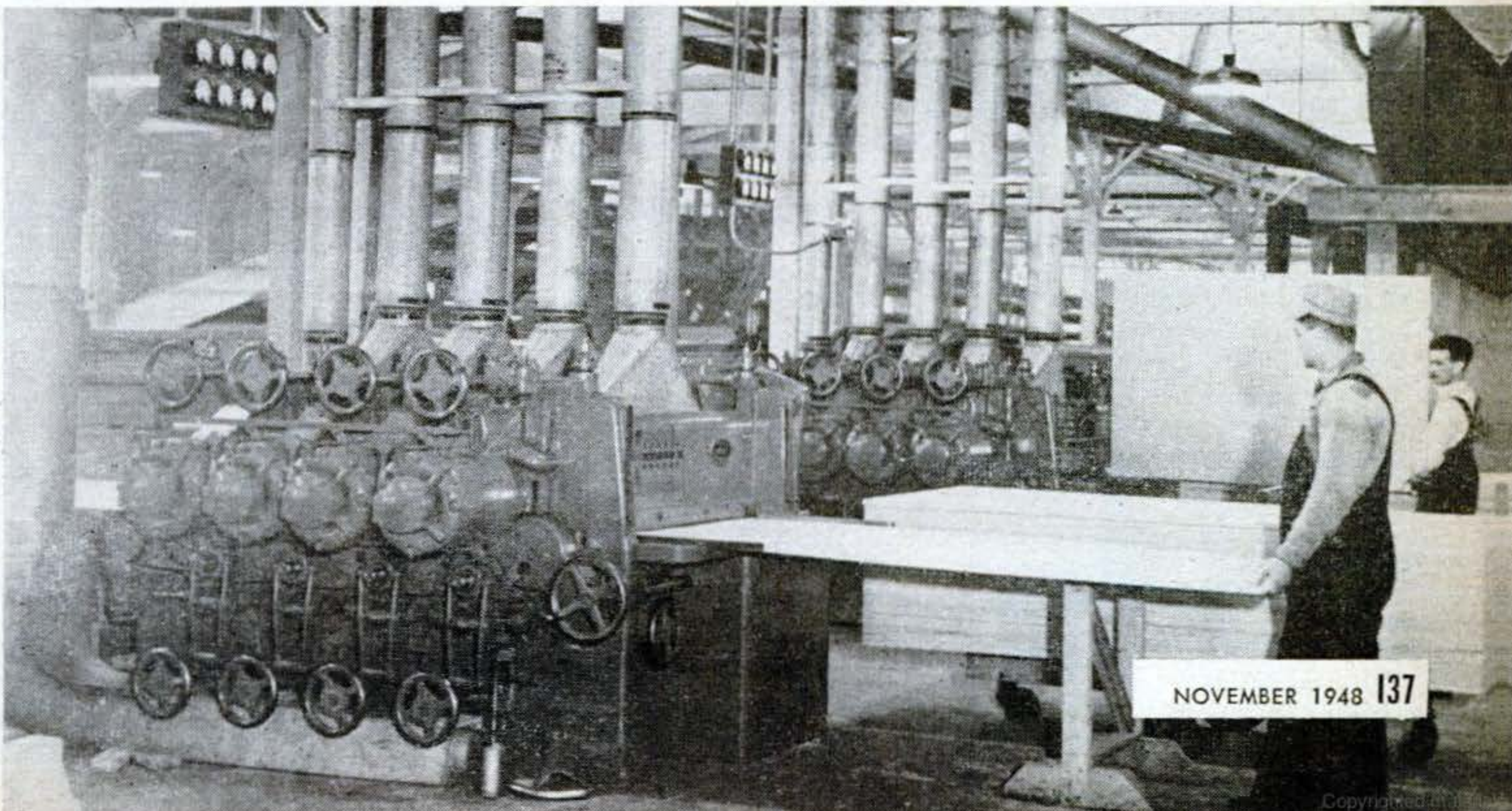
9 Hydraulic lift carries workmen up and down face of big hot-plate press, where 1,800-lb. pressure and 270° F. heat convert phenolic-resin glue in panels into insoluble plastic bond.

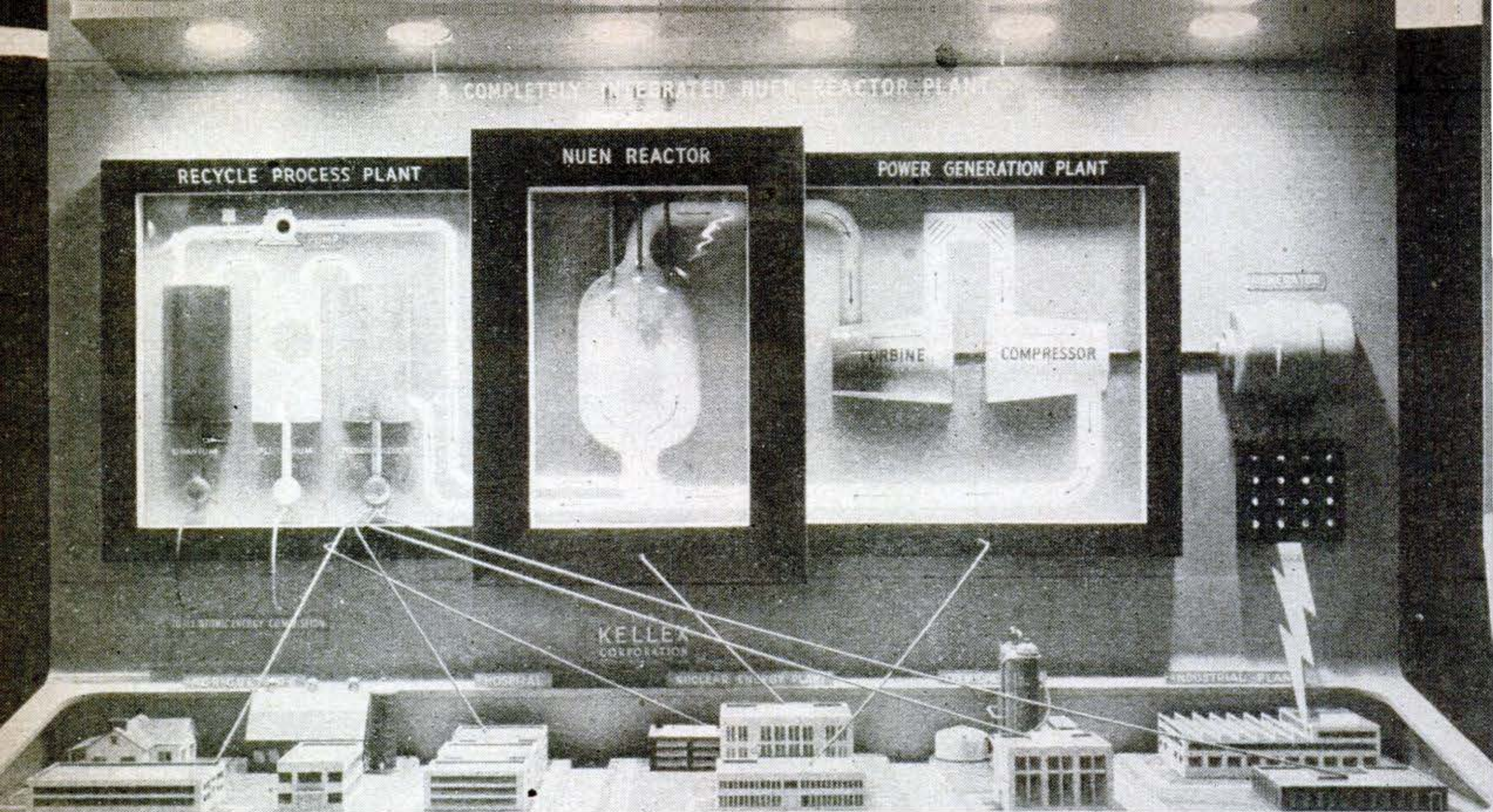


10 After 5-minute cooking, glued panels move to trimmer where they are cut to desired size, usually standard 4- by 8-foot panel. These can be spliced to make larger panels.

11 In final operation, panels are fed through large, four-drum rotary sanders for smooth finish. Small defects, which may show up after

sanding, are then hand-patched and resanded. All waste wood, including sawdust, is burned to supply plant's steam and electric power.





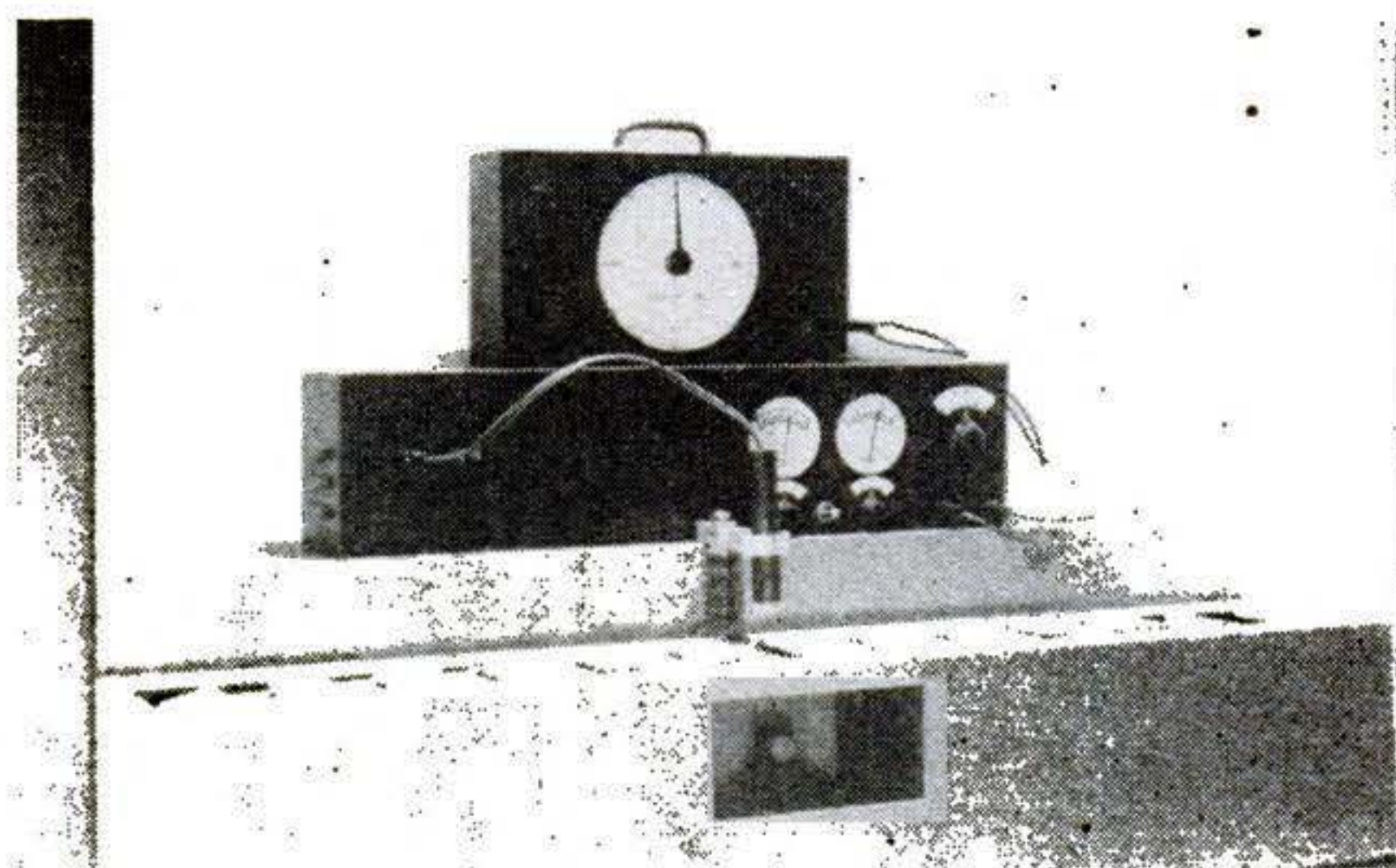
Atomic power plant of the future, called Nuen (for NUClear ENergy) by its designers, will make not only electricity, but also chemicals

for bombs, industry, medicine, research, and agriculture. Display by Kellogg Corp. shows how the plant will serve an entire community.

How Industry Plans to Put Atom to Work

INDUSTRY'S engineers are finally putting overalls on the atom. The first concrete examples of the ways atomic energy might find the practical uses so often predicted for it were shown in models in a recent New York exhibit. Displays covered possible applications of radioisotopes and high-voltage generators as well as nuclear power.

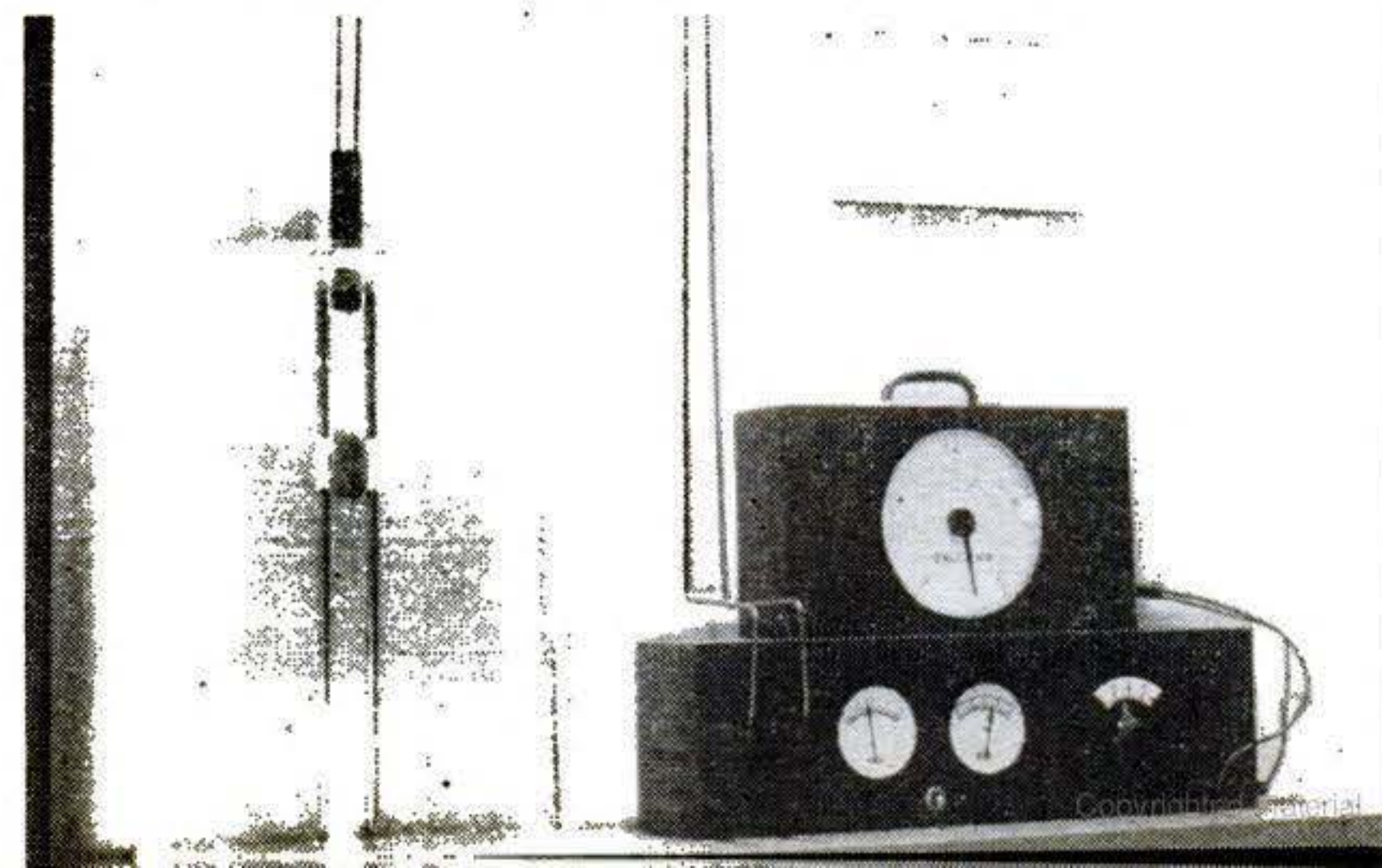
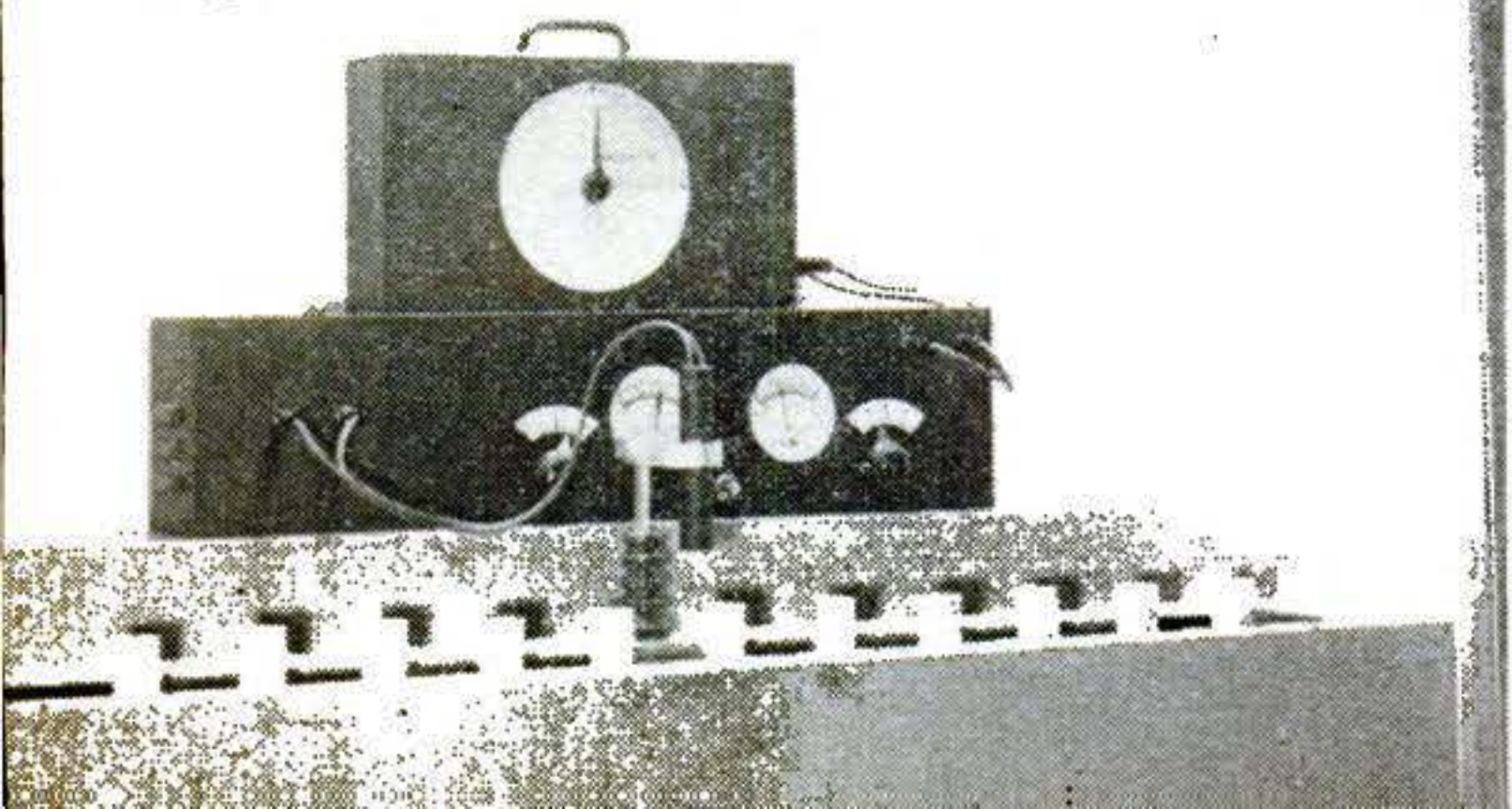
Invisible labeling is provided by isotopes used with model shown below. Trace of radioisotope added to some metal slugs makes meter needle swing when those slugs pass under detector.

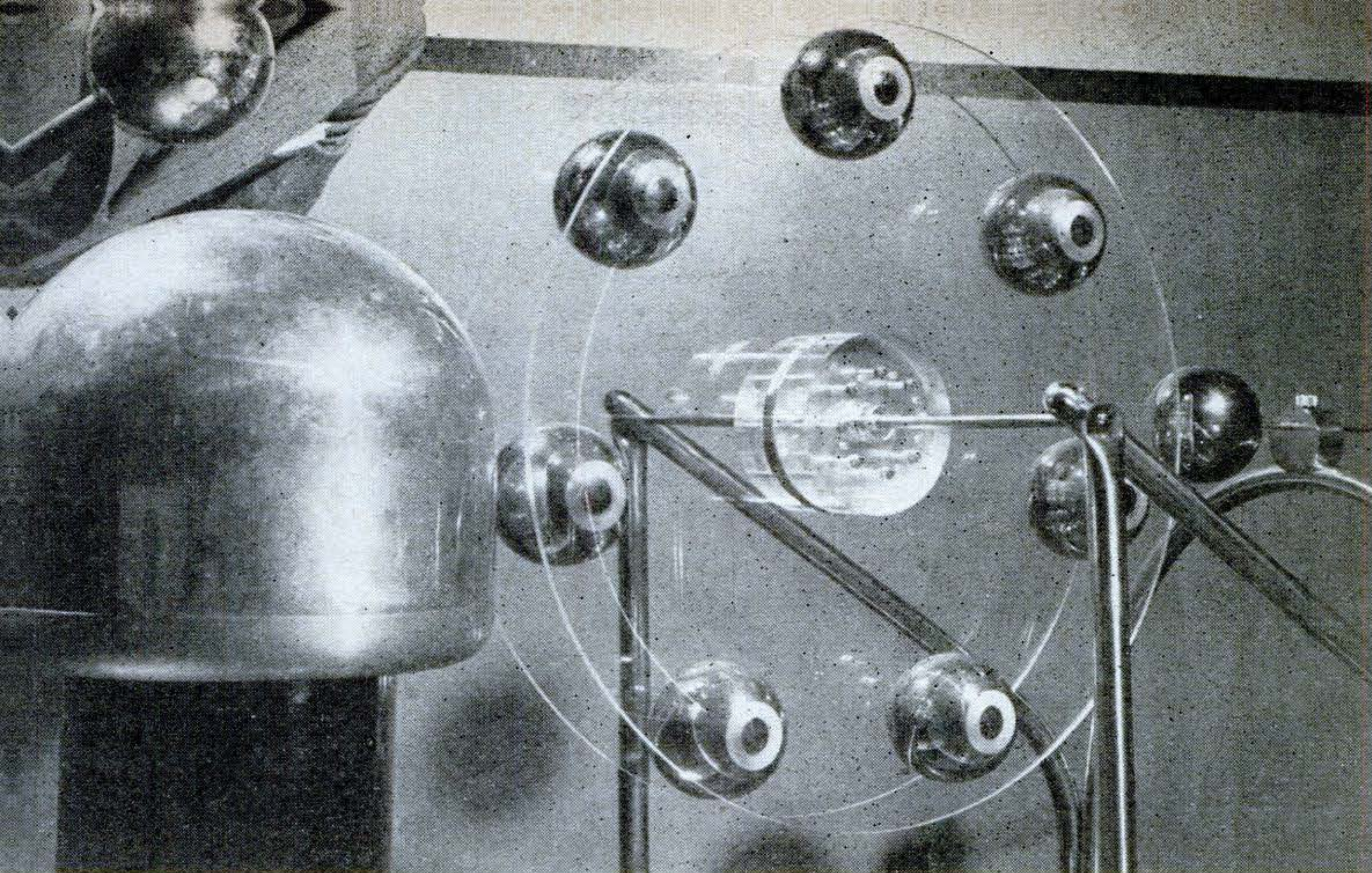


Unique measuring devices using radioisotopes were suggested in Allis-Chalmers exhibit. In model above, detector gauges thickness of metal plates by counting rays from isotope under belt.

Floating radioactive capsule makes liquid gauge in another Allis-Chalmers model. Meter tells height of liquid in tank from the intensity of rays reaching the detector tube over tank.

138 POPULAR SCIENCE

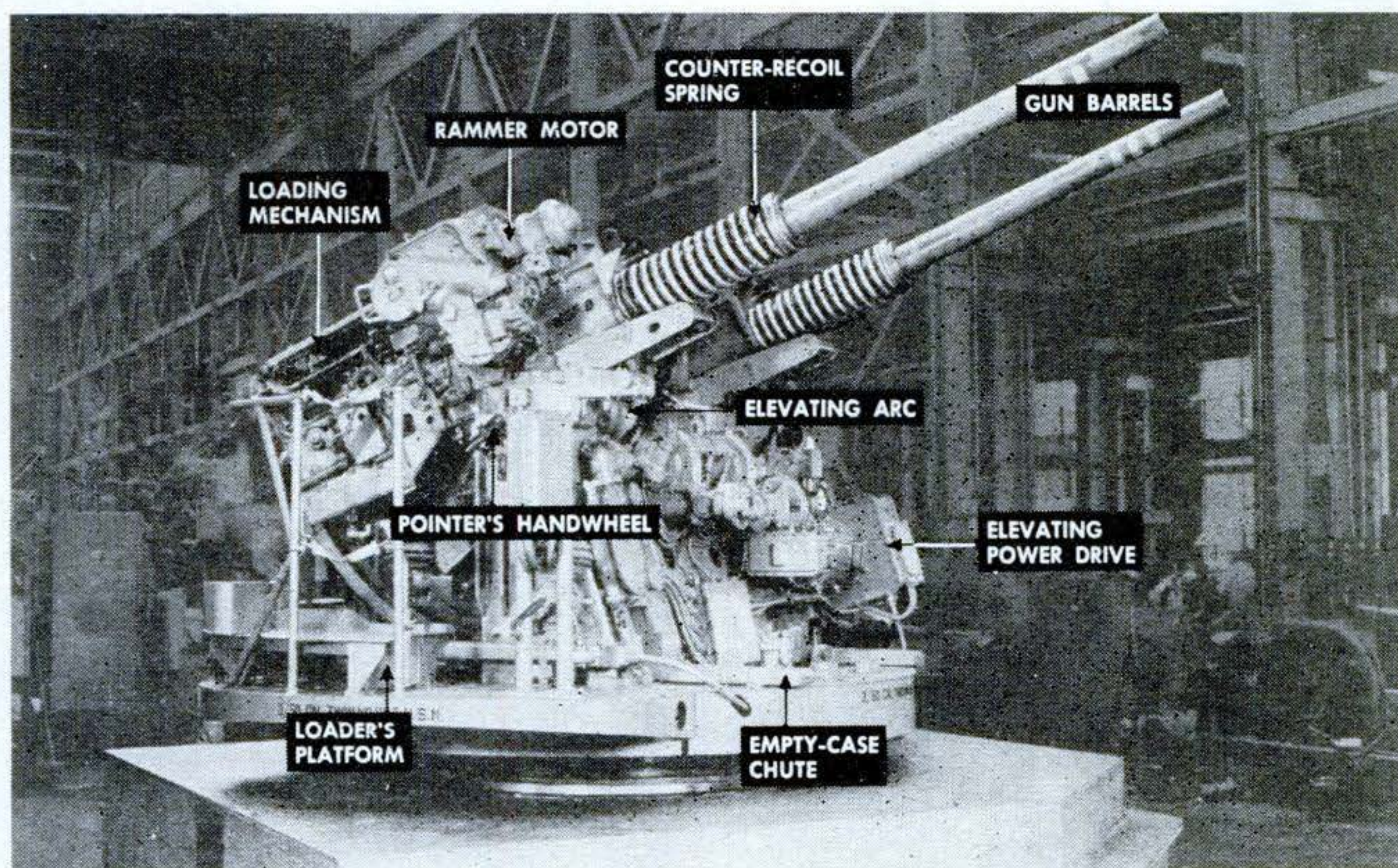




Motor that runs on static electricity is part of Westinghouse exhibit. High-voltage charge from generator at left builds similar charge in

nearest copper sphere of motor. Since like charges repel, sphere is driven away from generator, turning motor at speeds up to 100 r.p.m.

Navy Develops New 3-in. AA Gun



THE Navy's answer to suicide dive-bombing is a new 3-inch antiaircraft gun that is reported to fire more than 150 high-explosive shells a minute. Designed

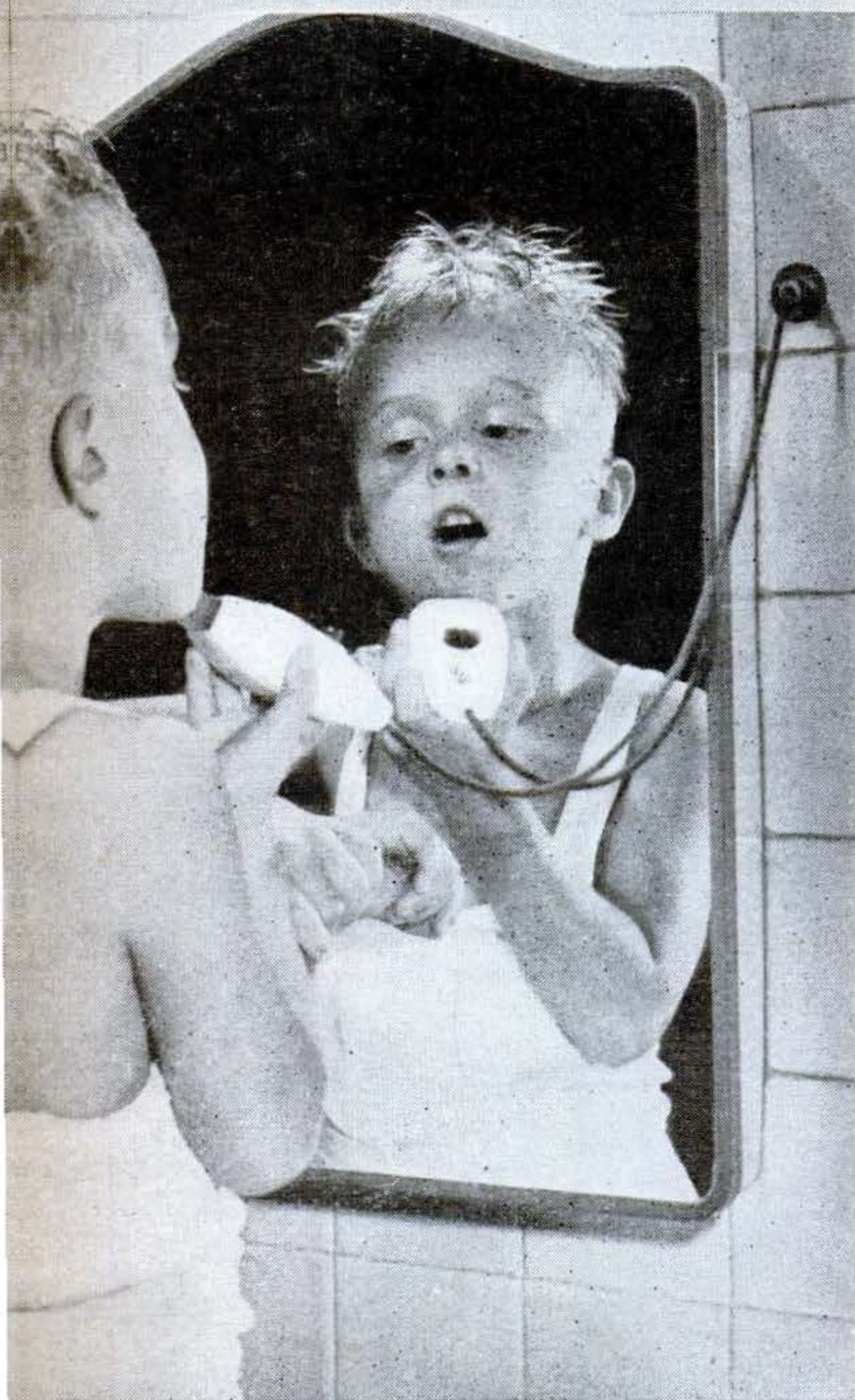
to replace the Bofors 40-mm. gun used against close-in attacks in World War II, it has twin barrels each 150 inches long and an automatic loading mechanism.

New Toys

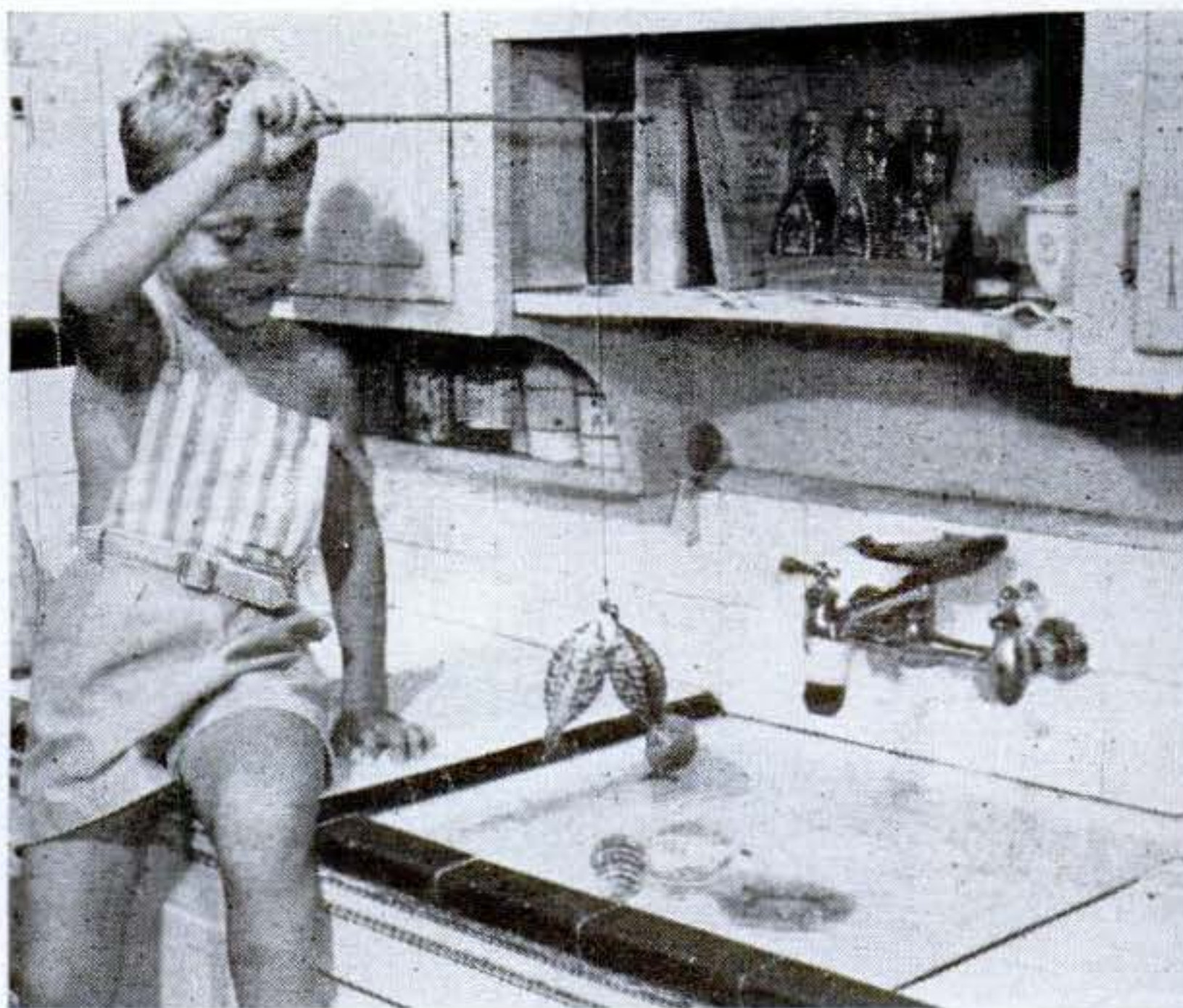
IN STRIDE with the rising birthrate, U.S. toy makers are setting another production record this year. Sales, now booming all year 'round, reach their annual peak in the month from Thanksgiving to Christmas. At the present pace, they will climb to a total of \$300,000,000 for the year—\$50,000,000 over 1947's mark. Here are some of the newer toys now on the market.



Combination tricycle and trailer wagon lets a child take a passenger or his toys for a ride. The Hettrick Mfg. Co. makes it of heavy-gauge steel with 12-, 16-, or 20-inch front wheels.

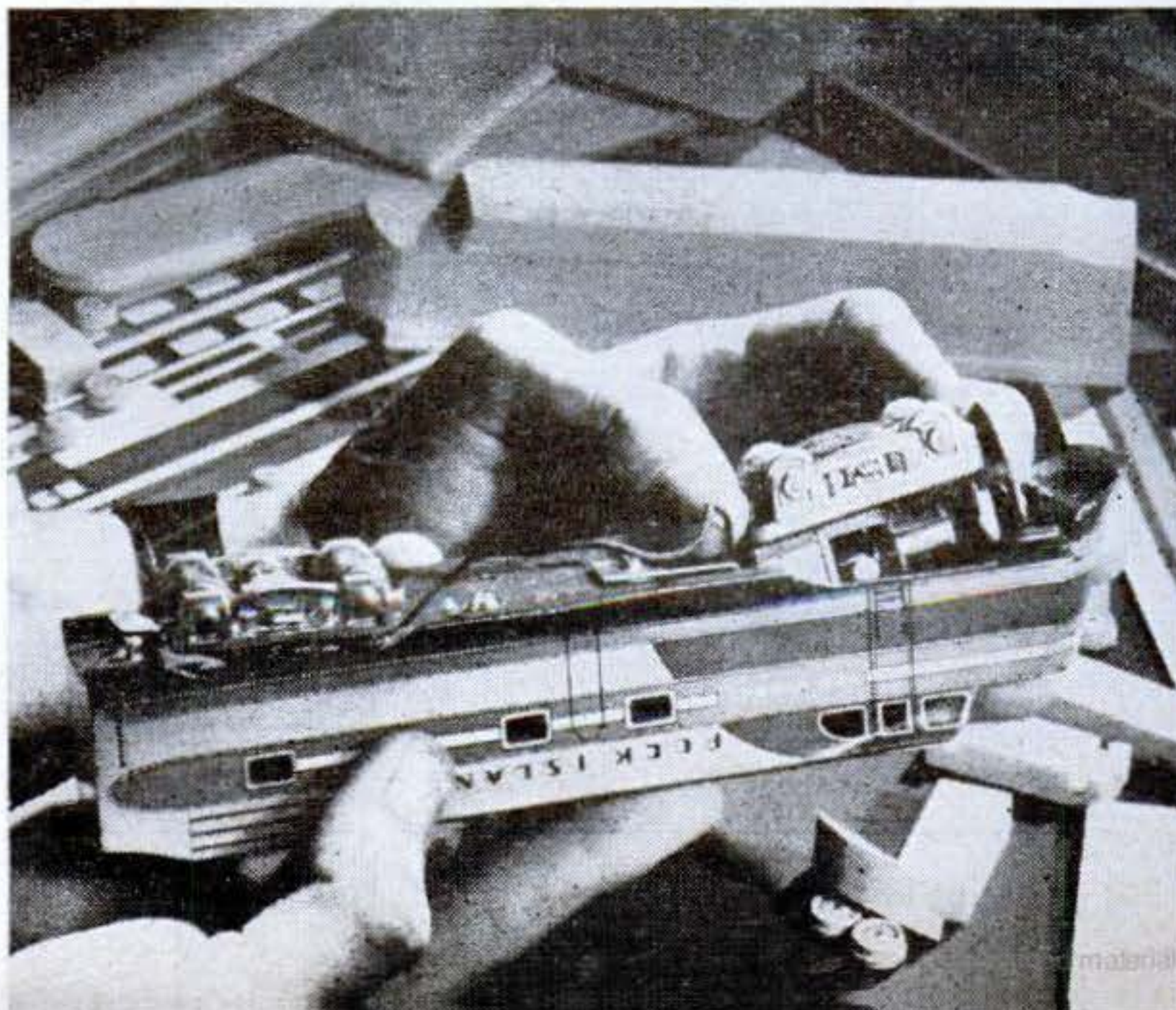


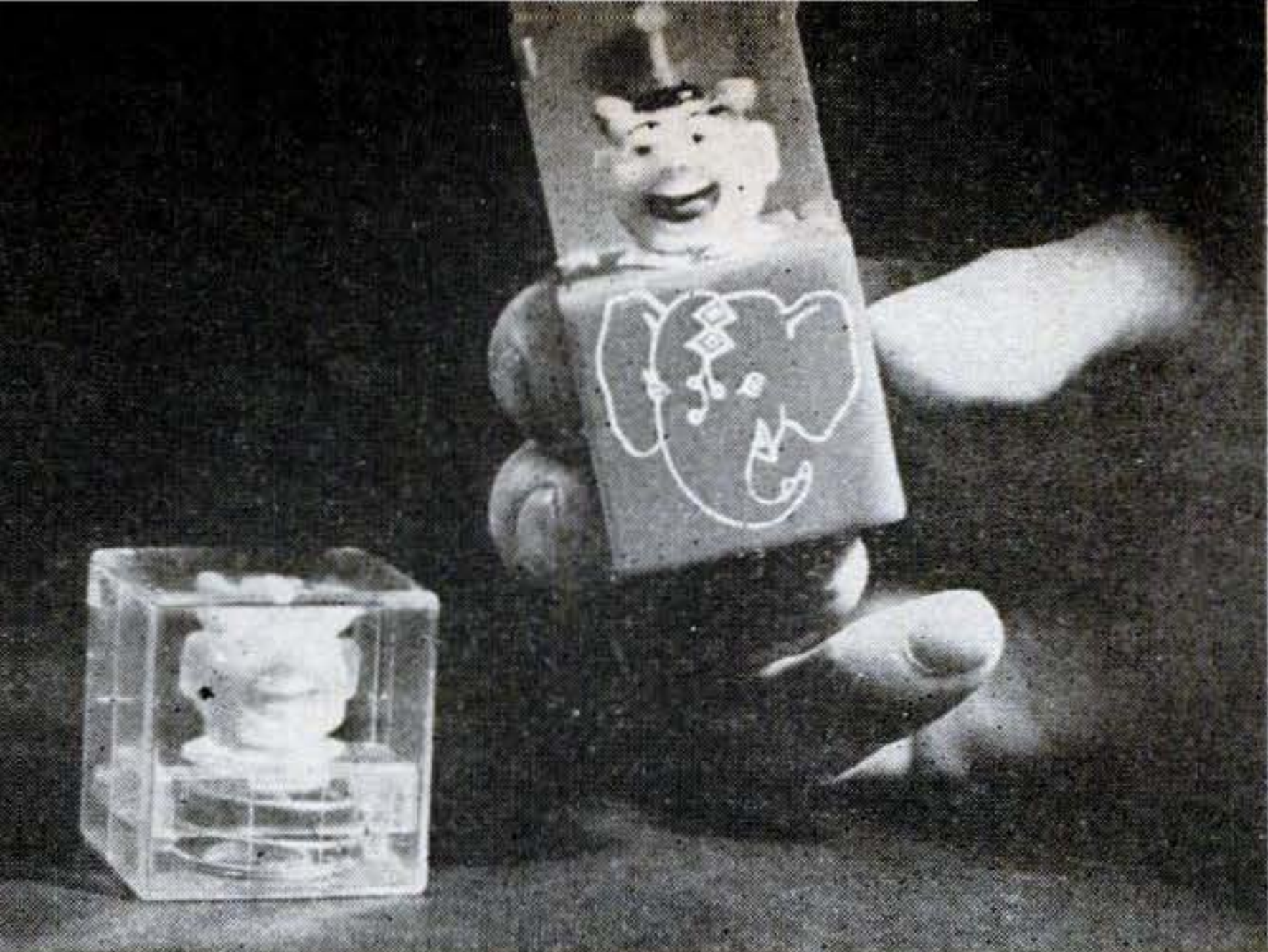
Make-believe electric shaver buzzes realistically. It has a wind-up motor and rubber vacuum cup on the cord to "plug" into any wall. Maker is Ideal Novelty & Toy Co.



Junior can catch these inflated plastic fish in the kitchen sink or bathtub. Magnet on end of the line "hooks" them by metal rings in their noses. Set is made by Transplastic Mfg. Co.

Wooden scale model of Rock Island locomotive can now be electrified to pull HO-gauge train. Strombeck-Becker, maker of wooden train, sells plans for adding motor, power trucks.





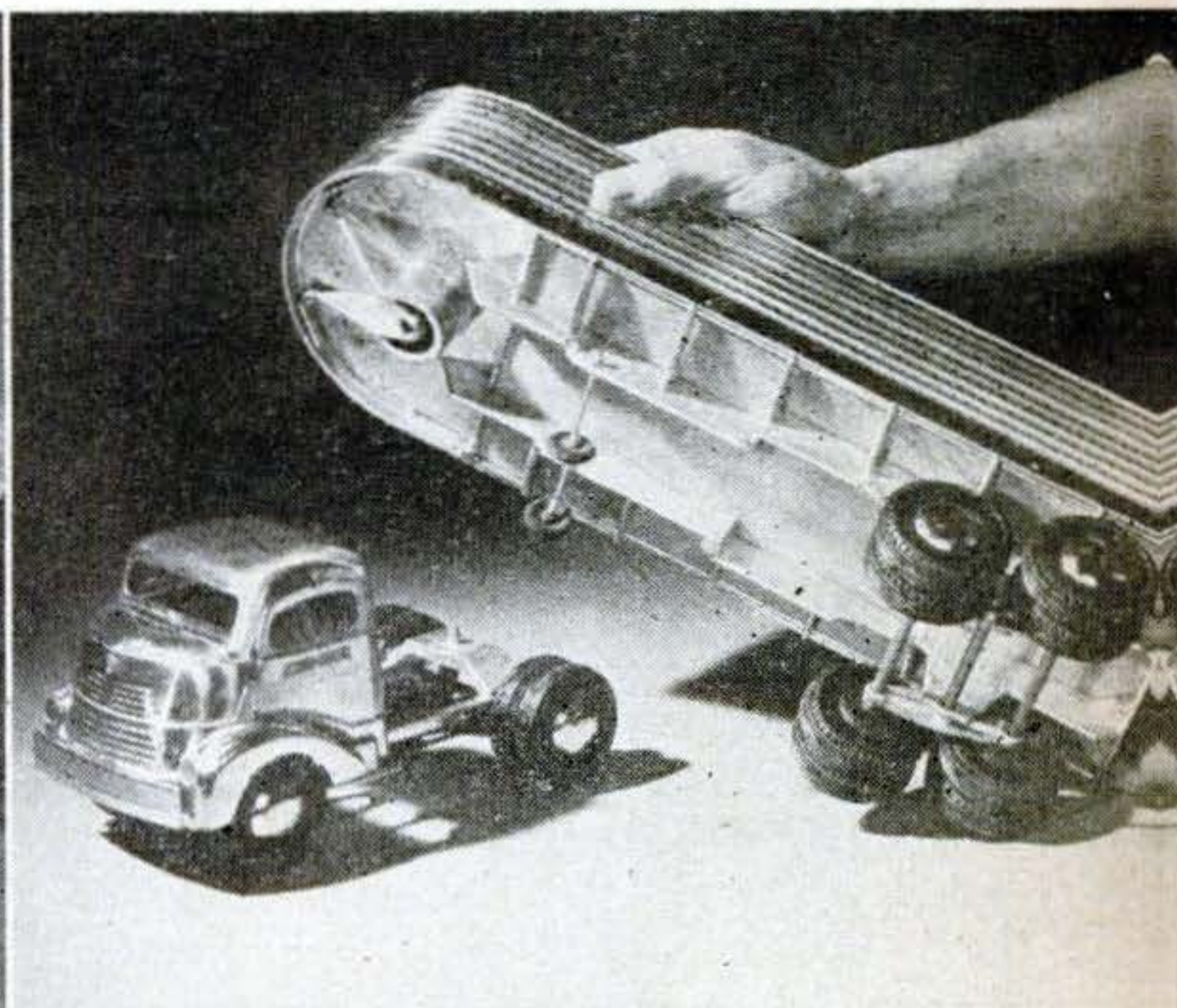
Jack-in-the-box, propelled by a spring, pops up when this 1½-inch plastic cube is squeezed. Other toyland characters also come in pop-up boxes, made by the Noma Electric Corp.



Weighted at bottom with sand, punching bag comes back for another smack when hit. Made of plastic by Marty Gilman, Inc., inflated toy can double as a football tackling dummy.



Hockey teams chase tiny puck over "ice" in this new table game, made by Remotrol Co. Two opponents maneuver players by moving magnets on sticks under raised playing surface.

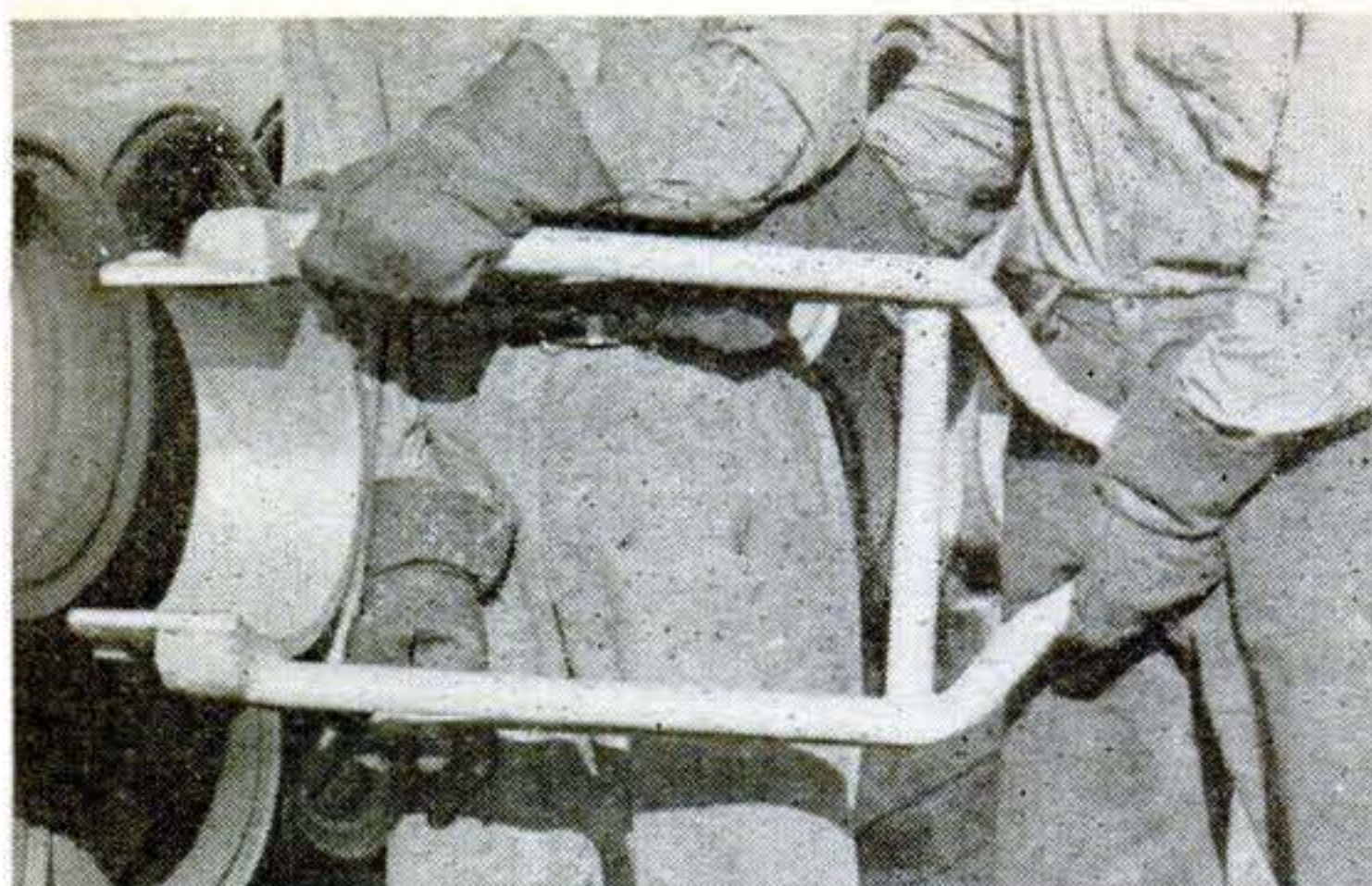


Model trailer truck, based on actual Fruehauf design, is one of a line of Smith-Miller toy trucks. Sturdily built of aluminum, it has die-cast frame, dual rear wheels, retractable "landing gear."

Workable road grader is latest addition to Charles Wm. Doepke Mfg. Co.'s series of scale-model road equipment. This 26-inch miniature of an Adams machine has movable steering gear

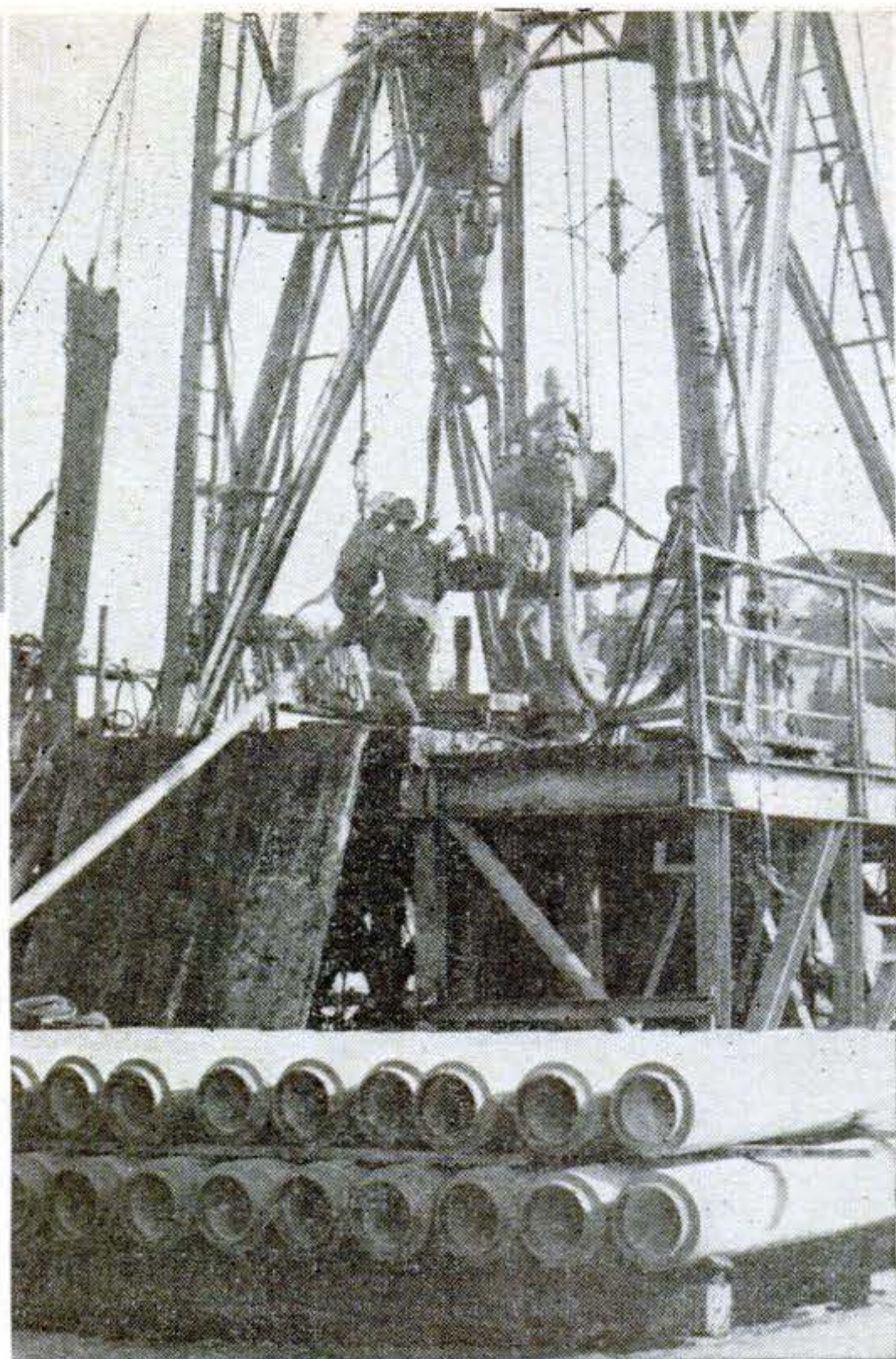
and knee-action, tandem rear wheels. The pushing blade can be raised, lowered, moved in a 90° arc, and locked in any position. Grader weighs 10 pounds to the real thing's 10 tons.





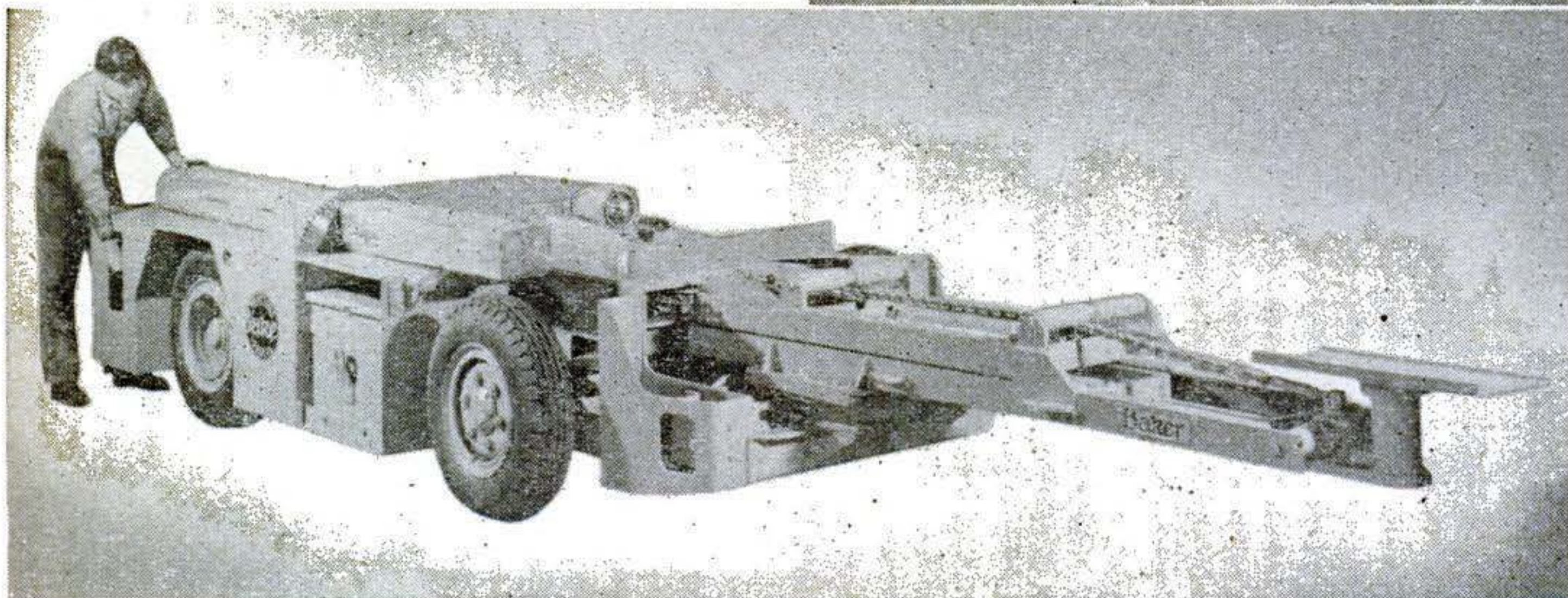
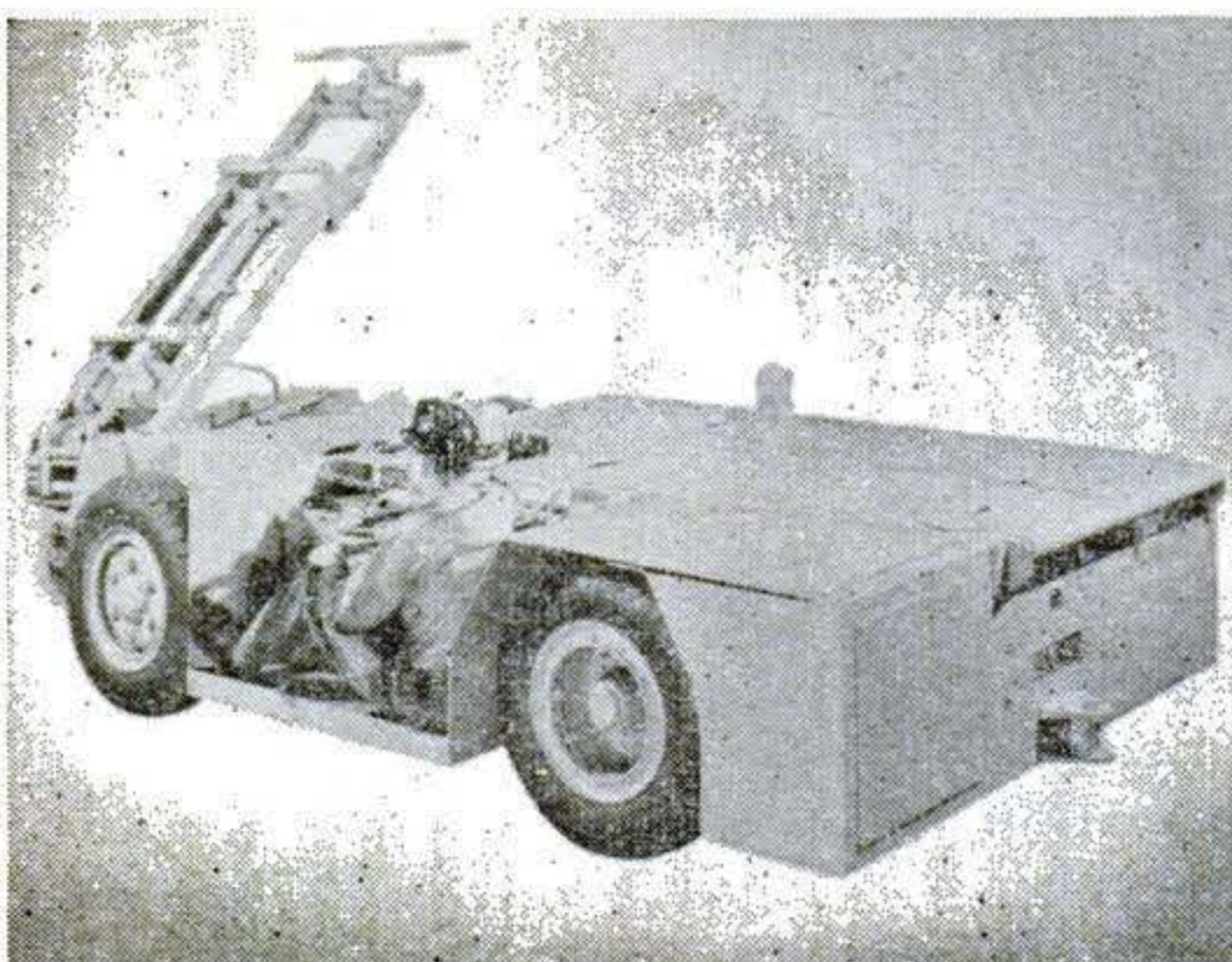
Concrete Pipe Is Tough

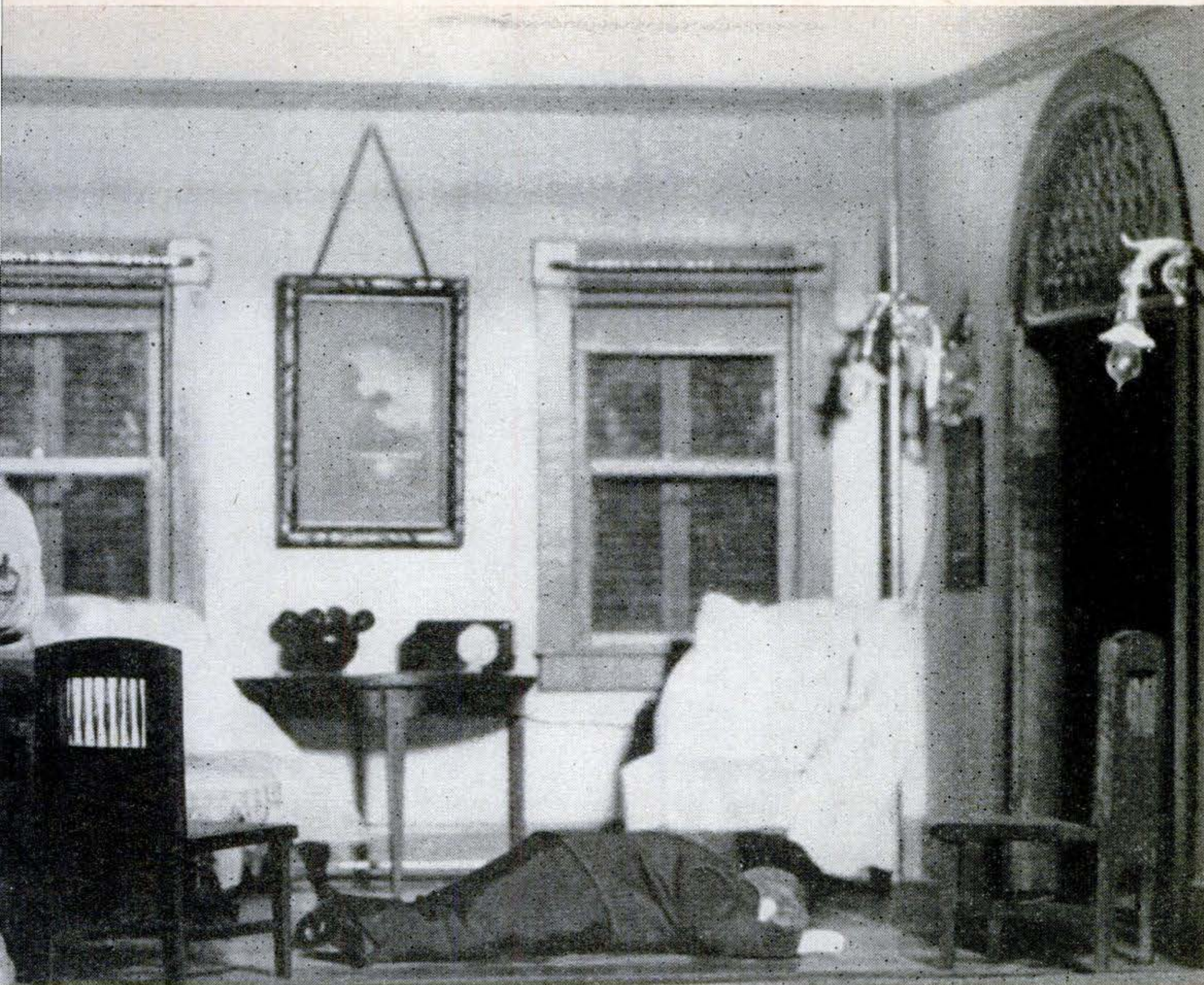
THE oil-well casing shown at right, made of concrete spun around a reinforcing framework of spiraled steel rods, saves nine-tenths of the metal used in conventional castings. With the superstructure revolving at 3,000 r.p.m. as concrete is shot through, centrifugal force causes the cement to set with unusual compactness, making it nonporous. The inventor, Charles E. Knox, of Tulsa, Okla., claims that the casing also resists corrosion. The photo above shows a special grapple hook used for handling the pipe and lowering it into an oil well.



Machine Aids Timbering

THE crossbars and side posts that support coal-mine shafts are erected more quickly and safely with this timbering machine developed by the Baker-Raulag Co., of Cleveland. At right is shown the hydraulically operated swinging boom that holds crossbars against the mine roof while posts are cut to length by a circular saw mounted on the machine, as illustrated below. This photo has the boom lowered to show the saddle in which crossbars are held. A trailer, not shown, carries bars, posts, and wedges.





Midget corpse sprawls amid furniture built to scale for study at Harvard Medical School.

Dolls Die for Crime Doctors

By William Gilman

THEY'RE teaching murder at Harvard—but the victims are dolls, and so are the killers.

These 6-inch actors populate a pigmy world of violence called the Nutshell Studies of Unexplained Death. Their re-enactments of crime are used by the university's Department of Legal Medicine to teach medical

students and visiting coroners and detectives how to solve strange cases of sudden death.

One of the models, "The Case of the Hanging Farmer," looks clearly like a suicide. A man's body is hanging at the end of a rope in the barn. But the real answer is: an accident. The farmer just wanted to frighten his wife, with whom he had been quarreling. He had never intended jumping off the orange crate on which he was standing, with noose around his neck. But his weight was too much for the crate's slats. The broken crate gives the clue.

Another model is a double take. Scene 1 shows a murdered man on the living room floor. Scene 2 depicts the room 45 minutes later. A dumb-cop doll is loafing in the doorway, watching the wife doll sweep up. They've already carried the body to a couch, violating the principle that nothing must be touched—especially the deceased person—before the medical examiner arrives. Care-



Murder scene is constructed in minute detail for Harvard course to teach medical examiners how to spot clues in cases of unexplained death.



Tiny wine bottle for scene of fatal brawl is compared by Mrs. Frances G. Lee with the real one she copied. Scale is one inch to the foot.

ful eyes can spot 31 changes in the room between scenes.

The dolls and the stage sets in which they live and die are the handiwork of Mrs. Frances G. Lee, an elderly woman with a nimble brain and deft fingers. Since their purpose is to teach students that nothing can be taken for granted, Mrs. Lee has to be mighty careful herself. In painting a dead doll's face, for instance, she has to know the exact difference in color between the cherry-red of carbon monoxide poisoning and the various shades of purple that an ordinary corpse will acquire.

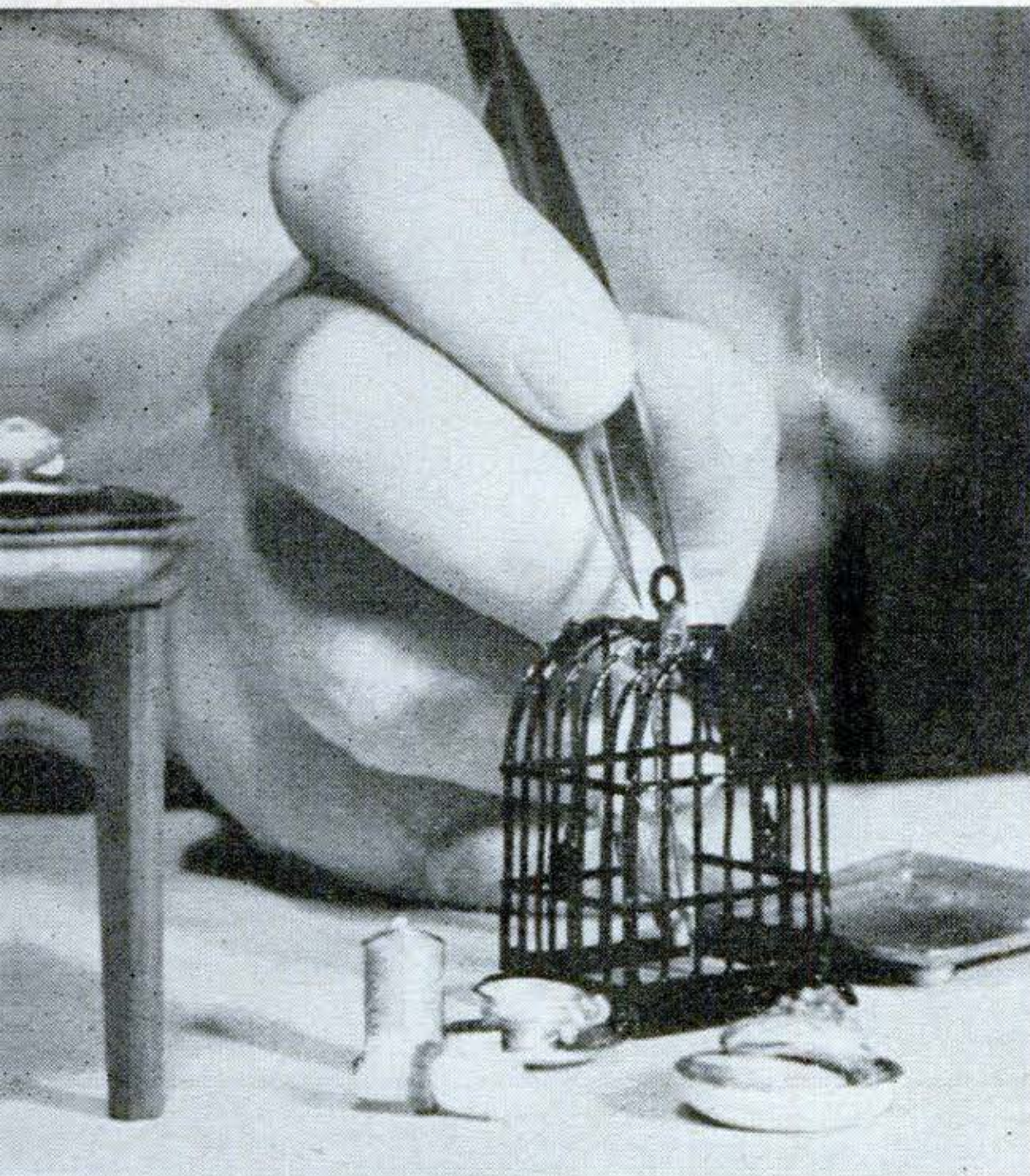
To provide every detail, Mrs. Lee's models are as realistic as life and death. One of them shows a house and basement. A tiny bulb inside the furnace makes it glow. There's even a mouse—made from half a pussy willow rubbed with soot—caught in a trap. Heel dents in the floor, cigarette butts, whisky bottles, powder burns—all are on the scale of an inch to the foot, to match the 6-inch dolls.

A skilled carpenter, Ralph Mosher, is Mrs. Lee's only helper. He uses nails made from needle points. To build a barn, he needed weathered boards and went to a

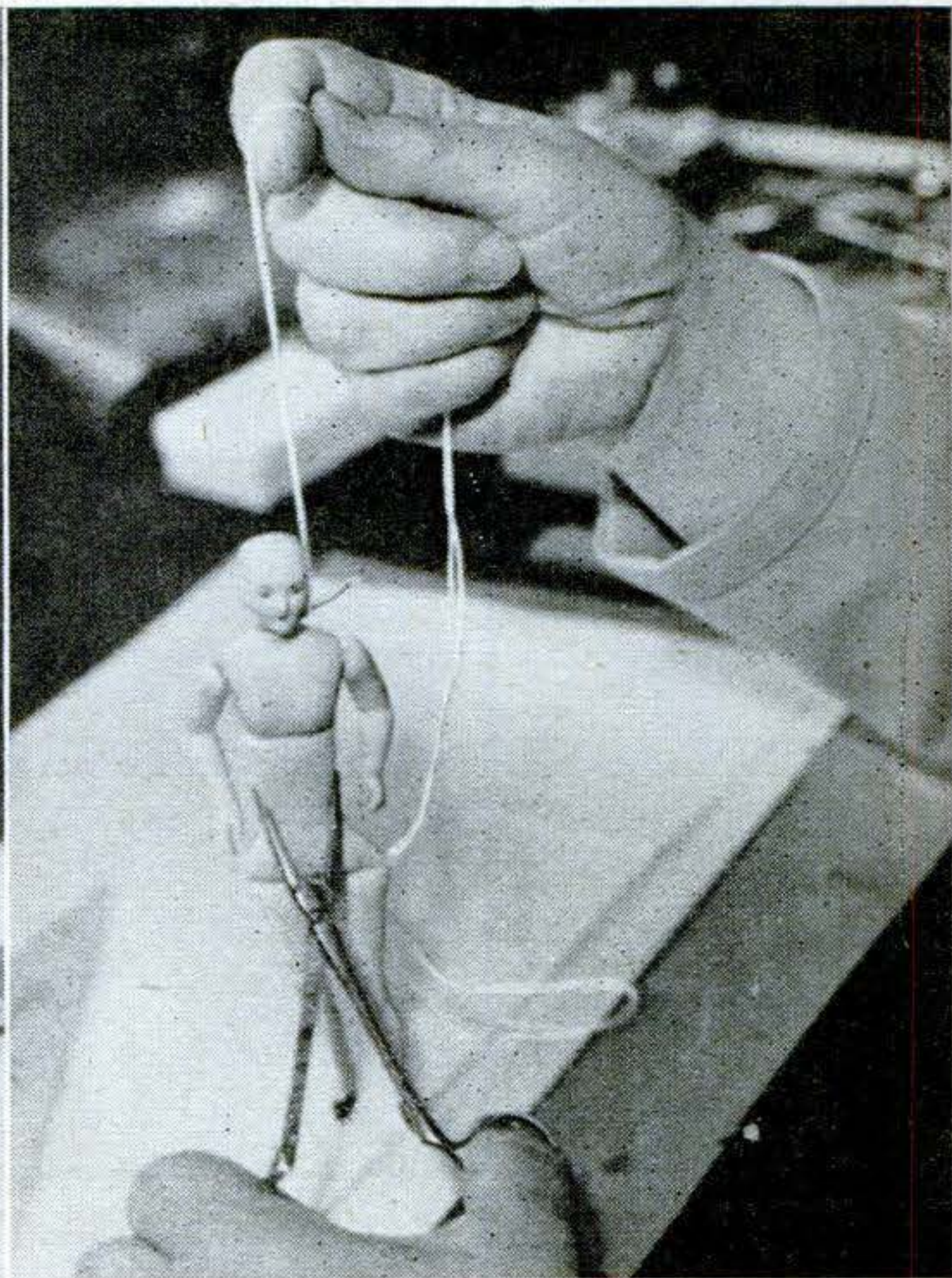
real barn for them. He carefully sliced off the inside and outside layers of the one-inch boards, threw away the middle, cemented the two layers together—and had weathered barn lumber $1/12$ of an inch thick.

The hardest work, Mrs. Lee says, is killing dolls properly. Made of bisque, they are so hard that they can be cut only with a diamond saw or dental drill. To make a murder victim sprawl naturally, slabs are sawed away at the shoulder and waist, and a pocket is cut into the mattress or floor. Threads from the arms, legs, and head are fastened underneath to produce the correct rigor mortis.

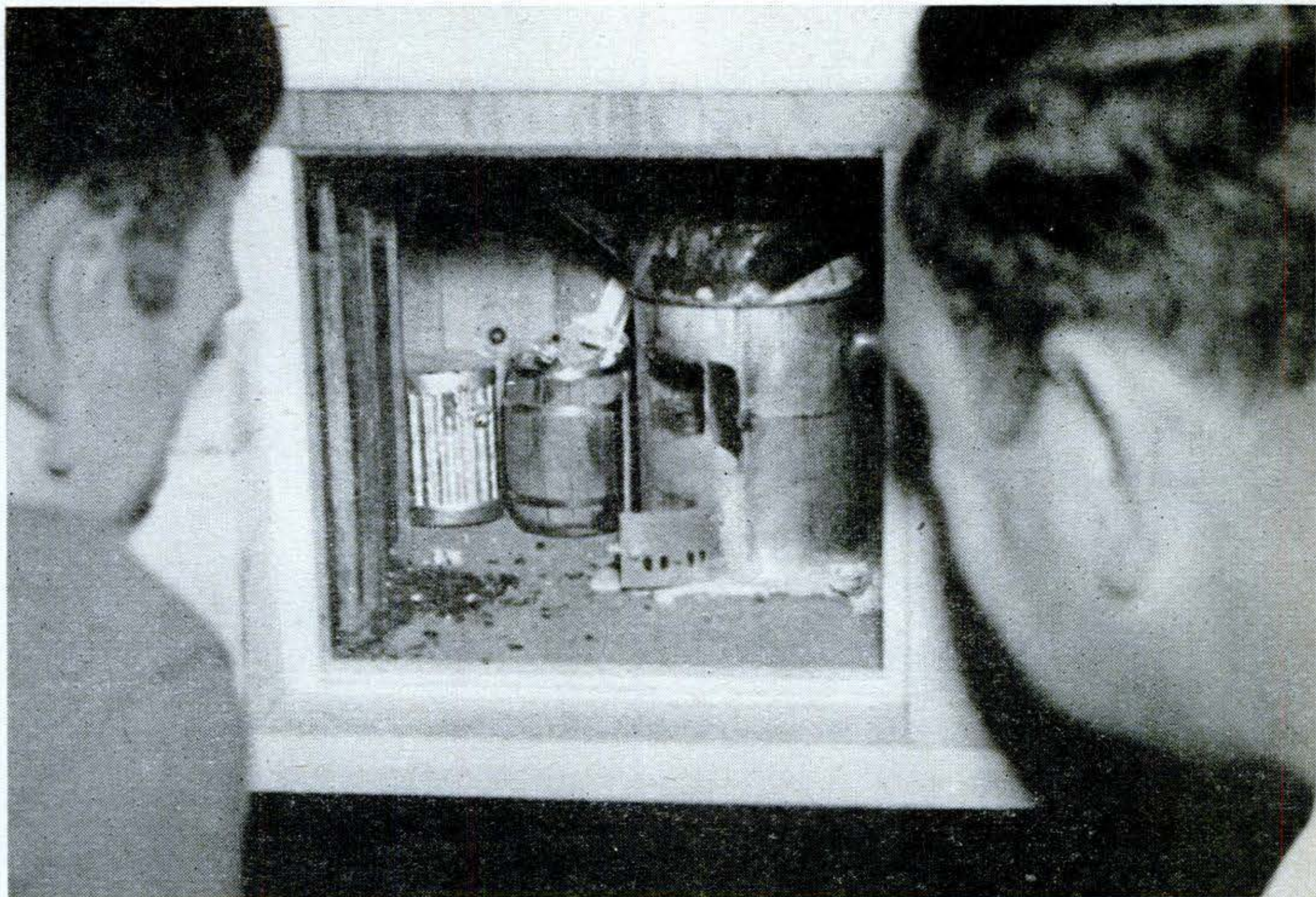
Mrs. Lee dedicates her Nutshell Studies to the proposition that we'd sleep easier if the law convicted more killers and pestered fewer innocent persons. Her models are booby traps driving home the lesson that a sleuth mustn't jump to conclusions. She tells of the hospital patient who died and was written on as a meningitis victim, until the medical examiner took a hand. He found meningitis infection all right, but found also that the bacteria had entered through a tiny, unnoticed wound—the real cause of death. The man had been stabbed with an icepick.



Doll-size parrot will witness murder in one of Mrs. Lee's tableaux. On the same scale are the dish of fruit, napkin in ring, coffee dishes.



Victim in hanging case is fitted with noose and tested for proper dangling position and elevation before getting clothes and hair-do.



Visiting detectives at Harvard examine basement scene for clues to murder of doll found dead in locked room upstairs. Carefully con-

structed details include coal spilled on floor, rust on furnace, unemptied trash barrel. These may indicate how long victim has been dead.

Homemade Slingshot Launches Plane



WHEN Alfred B. Bennett decided he would like to fly between his home and his job at an airport several miles away, instead of driving, he faced a problem.

His home, near Katonah, N. Y., had a front yard about 500 feet long. In a pinch, that was enough space to take off. But trees at both ends were too high to clear. Worse, the yard ran downhill. Worse still, it had rolling grades of 12 to 25 percent.

Yet the trip between home and office took him 40 minutes by car. With a small plane he could make it in 8 to 12, depending on the wind. And today he does, summer and winter, whenever the weather is good.

These pictures show how he solved the problem of a front-yard airport—but it's a trick only an extra-good pilot could pull off!



Preparing to launch 85-hp. Aeronca Champion II. Bennett braces two wood blocks in landing gear and loops rubber shockcord around them. Tension on cord holds blocks in place.

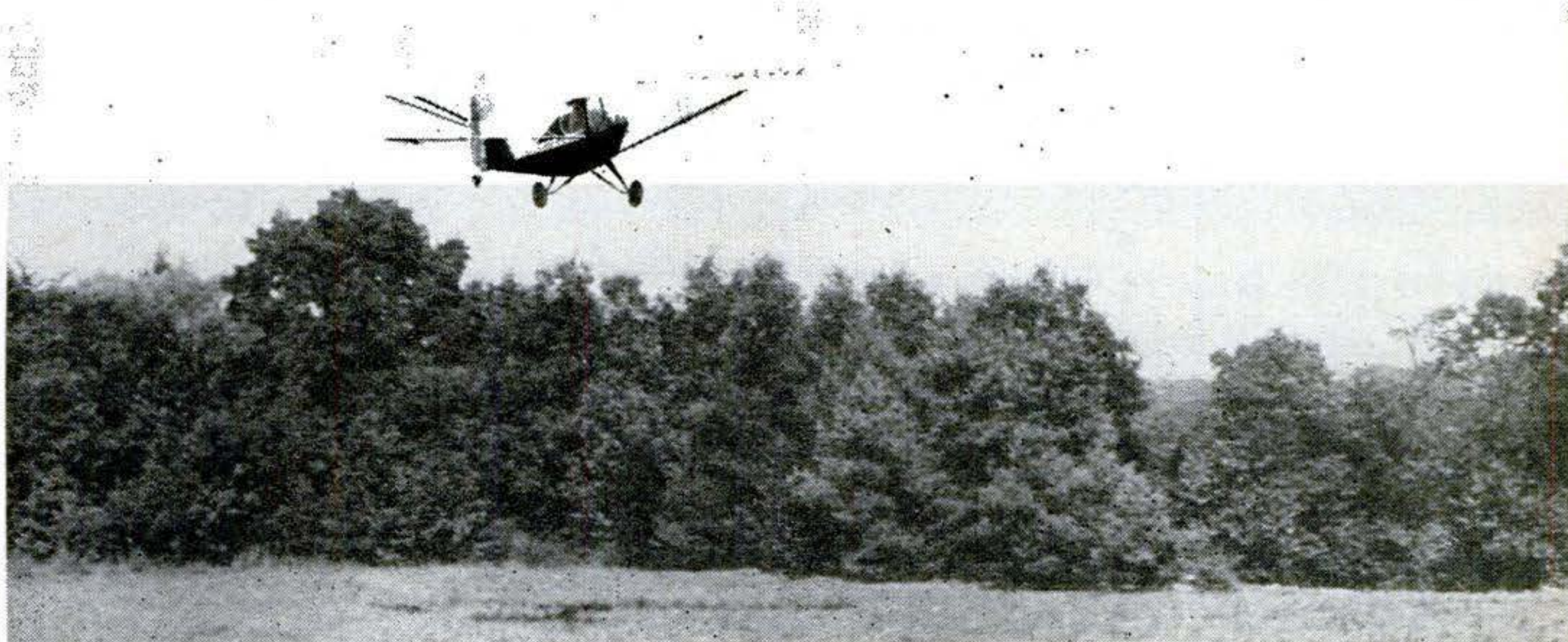


Next step is to stretch the rubber cord to double its length by hooking it to bumper of family car and driving forward as the plane is

held stationary by chocks under its wheels. Forward end of stretched cord then is hooked over a stake. Plane always takes off up hill.

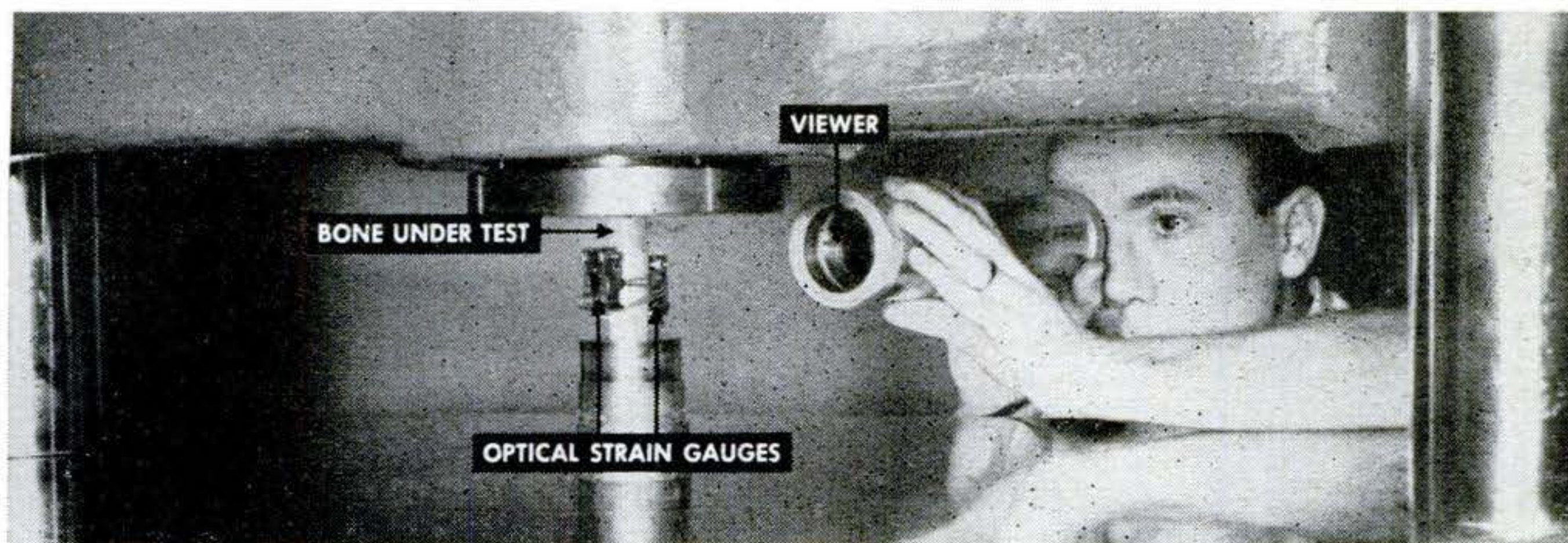


When chocks are jerked from under wheels, pull of cord helps engine flick plane into air in less than 200 ft. Release of tension on cord then lets the blocks drop from landing gear.



After taking off at 40 m.p.h., pilot holds the plane's nose down for a couple of seconds to gain more flying speed. Then he pulls up sharply just in time to clear the trees.

You're Tougher Than You Think



YOUR bones are twice as strong as hickory wood and 10 times as flexible as steel. So says the Navy, which has been testing human bones at the National Bureau of Standards in Washington with the apparatus pictured above. A piece of bone, machined to cylindrical

shape, is being squeezed in a hydraulic press. The operator peers through the telescopelike viewer to measure its shrinkage as the pressure mounts. The bone snaps at about 23,000 lb. per sq. in. Such tests will aid in designing safety devices for planes and ships.



Station Wagon Glows in Light of Approaching Car

THERE'S little chance of an approaching driver smacking into this station wagon at night. It stands out clearly in the light from another car because of a reflective sheeting applied over the wood paneling. Previously used on traffic signs and license plates for better night visibility (PS, July '48, p. 138), this sheeting now is available

in several colors and can be printed to look like any surface. You thus can put it on any vehicle without changing the daytime appearance (inset photo). The sheeting, called Scotchlite®, is an adhesive plastic film impregnated with tiny glass beads that reflect light back to its source without glare. It comes in rolls, like wallpaper.



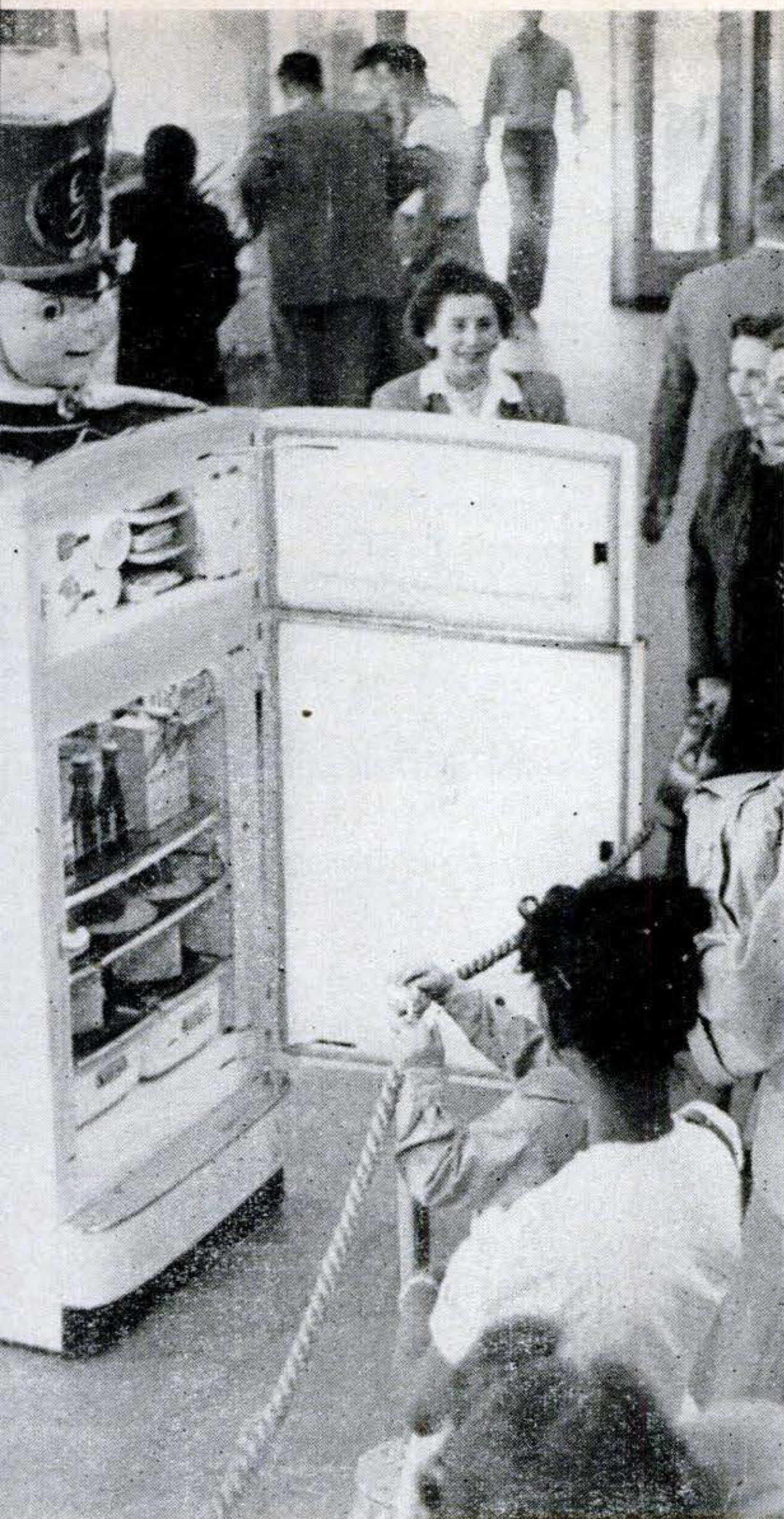
Mask Sharpens His Aim

THIS practice mask sharpens a football passer's target eye by making him pick out a receiver at a glance. The inventor, Prof. Hoyt L. Sherman of Ohio State, here shows how a tug on a string lifts the face flap to give Quarterback Pandel Savic a fleeting glimpse of his field. As the flap drops, Savic must throw without a second look.

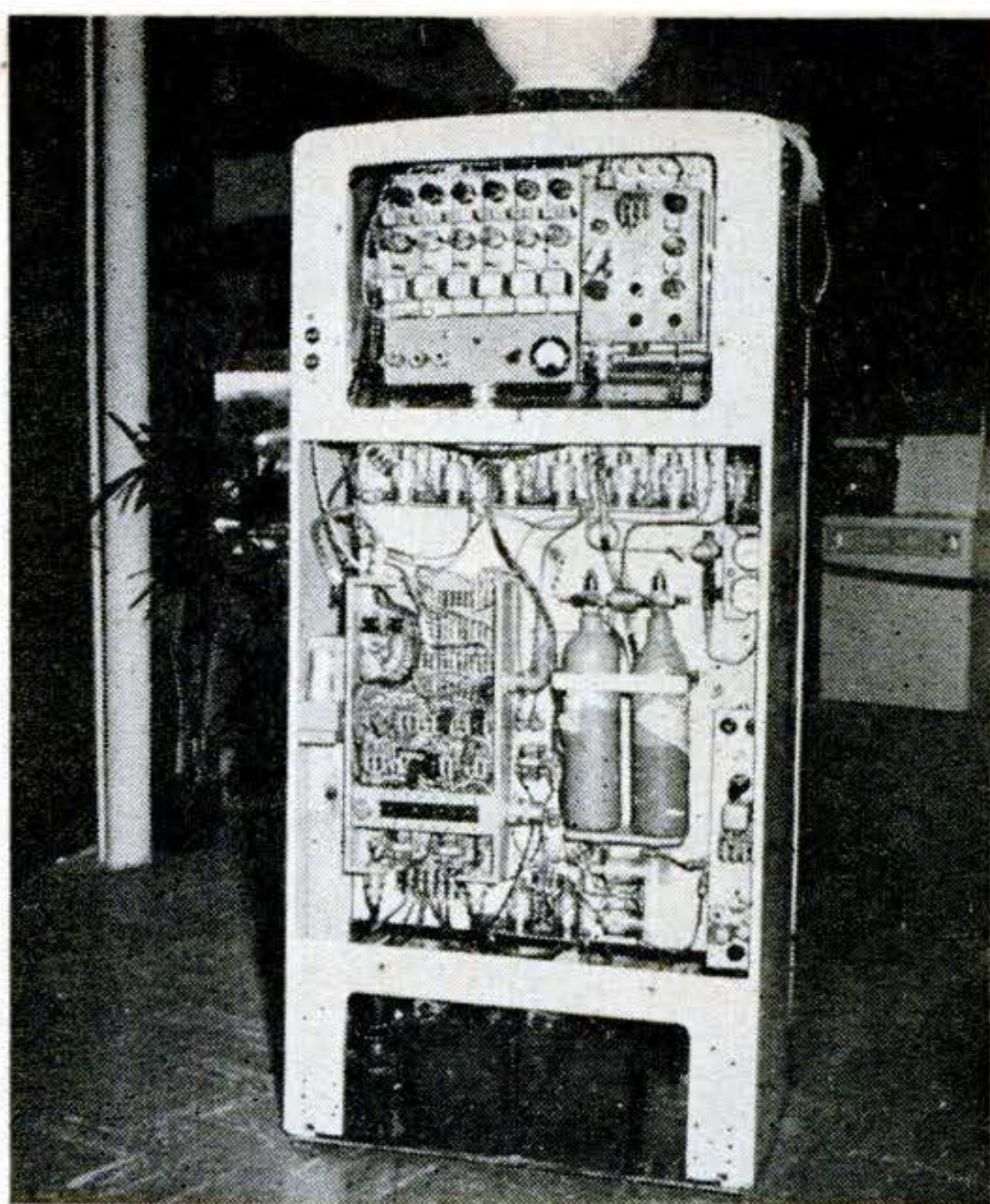


Fork Prong Saves Back

BILLED as a lazy-man's spading fork, this new garden tool was displayed recently at an inventors' exhibition in Paris. A spring-and-roller hinge holds its metal prong against the ground while the fork is pushed into the earth. The prong then serves as a fulcrum on which the fork handle operates as a lever to pry out a bite.



Junior, the talking refrigerator, amuses the patrons of a St. Louis department store. Junior can walk, dance, open and shut doors. His bow tie also lights up—for pretty girls only.



Junior's works are visible from back. Radio receivers are at top. Bottles below contain compressed nitrogen that opens and closes doors. Batteries at bottom furnish the electric power.



Technician at hidden console is Junior's voice and brain. Dial under right hand controls doors. Earphones report spectators' remarks picked up by microphone concealed over the display.

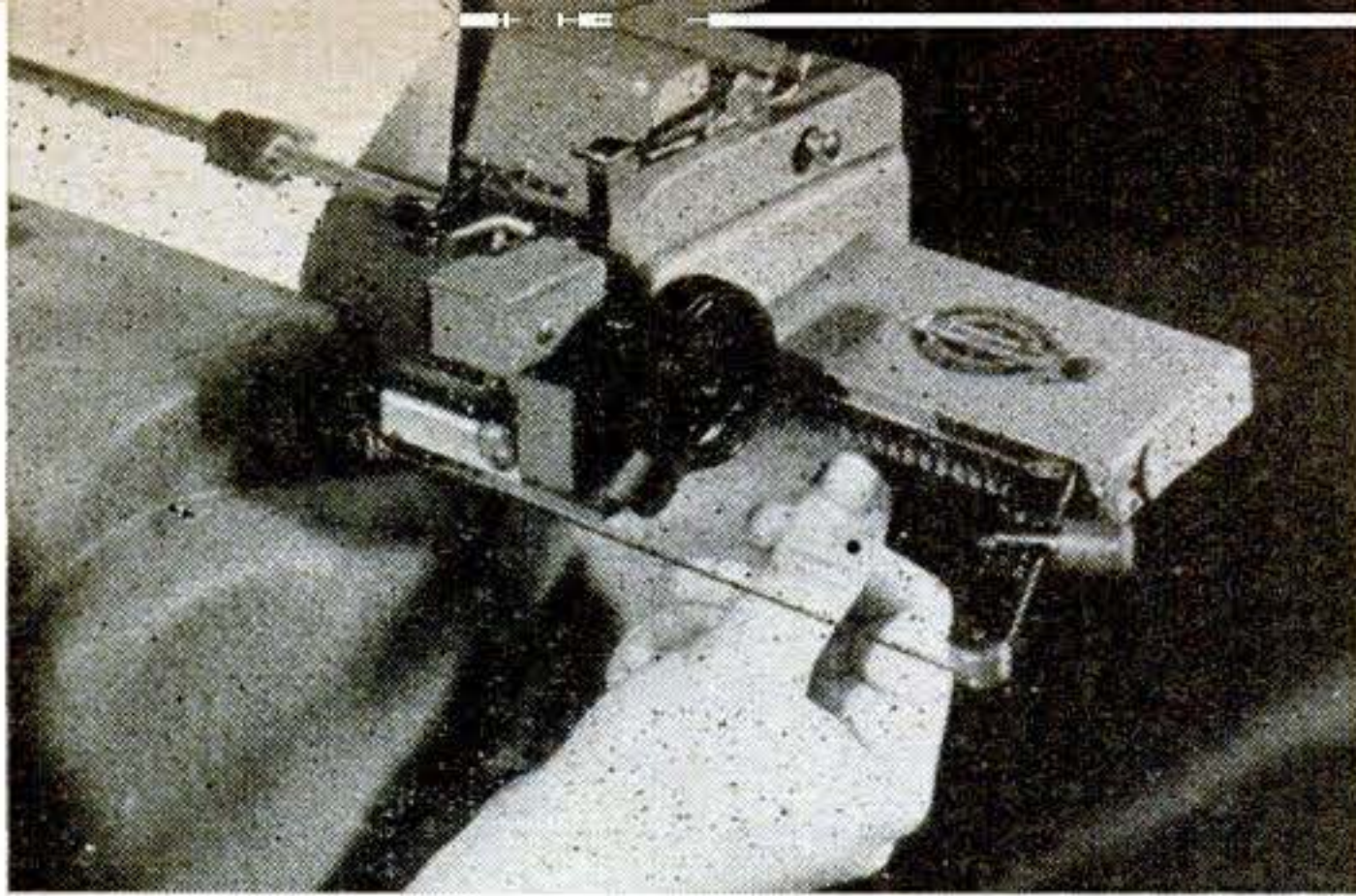
Trick Refrigerator Talks

IF YOU'RE looking over a refrigerator in a store some day soon, and its doors fly open and its shelves slide in and out while it says, "Hiya, bud"—don't run or even walk to the nearest exit. That's just Junior.

Junior is General Electric's talking refrigerator, now on a tour of home appliance displays. Except for his big rubber head, he looks like a standard box. But he can

talk, open his own doors, and even waltz.

The one thing Junior can't do is keep food cold. His freezing unit has been replaced with seven radio receivers, several motors and electronic devices, a loudspeaker, and a system of solenoid switches. An operator at a console concealed nearby furnishes Junior's voice and pushes the buttons that put him through his paces. **END**



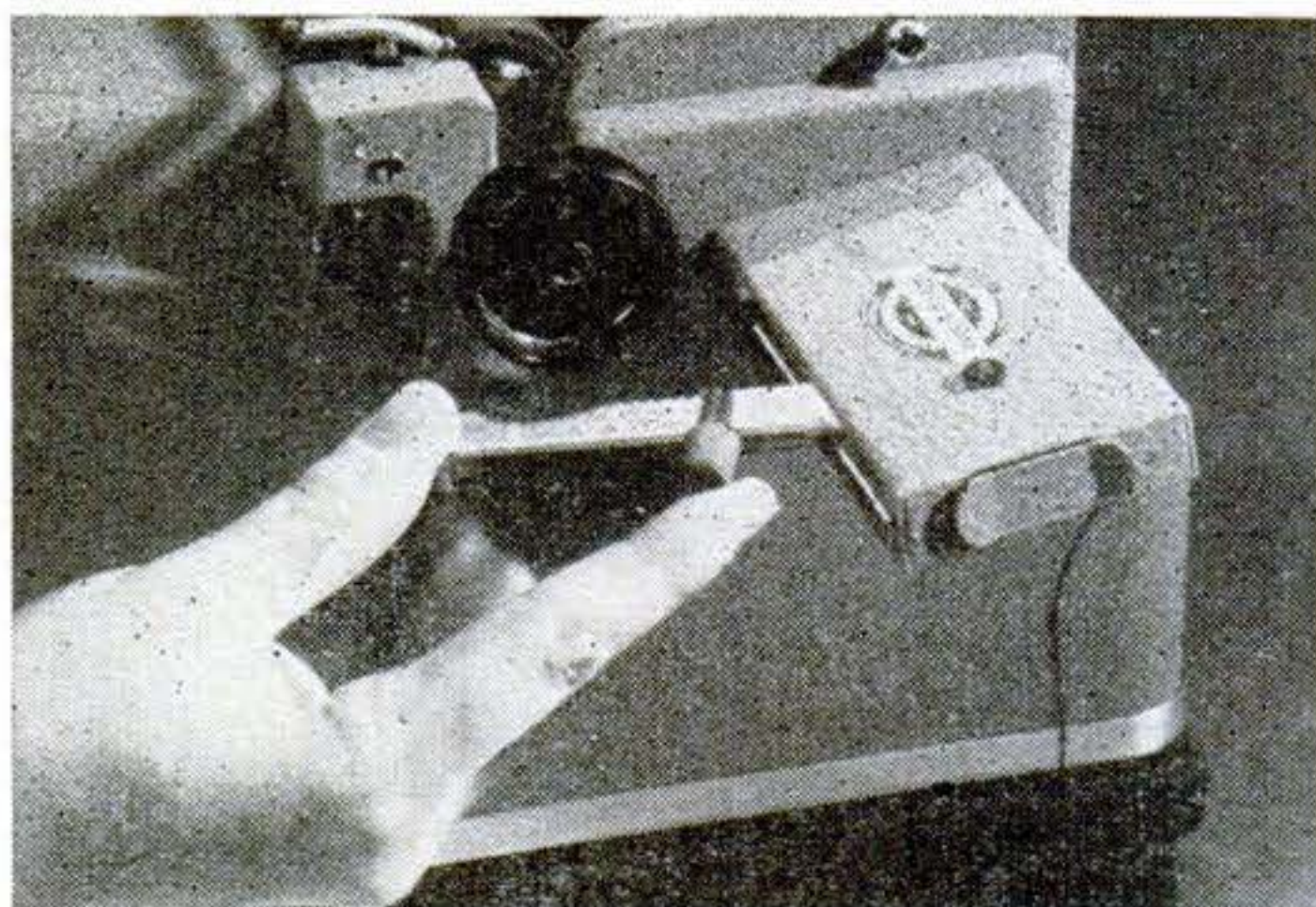
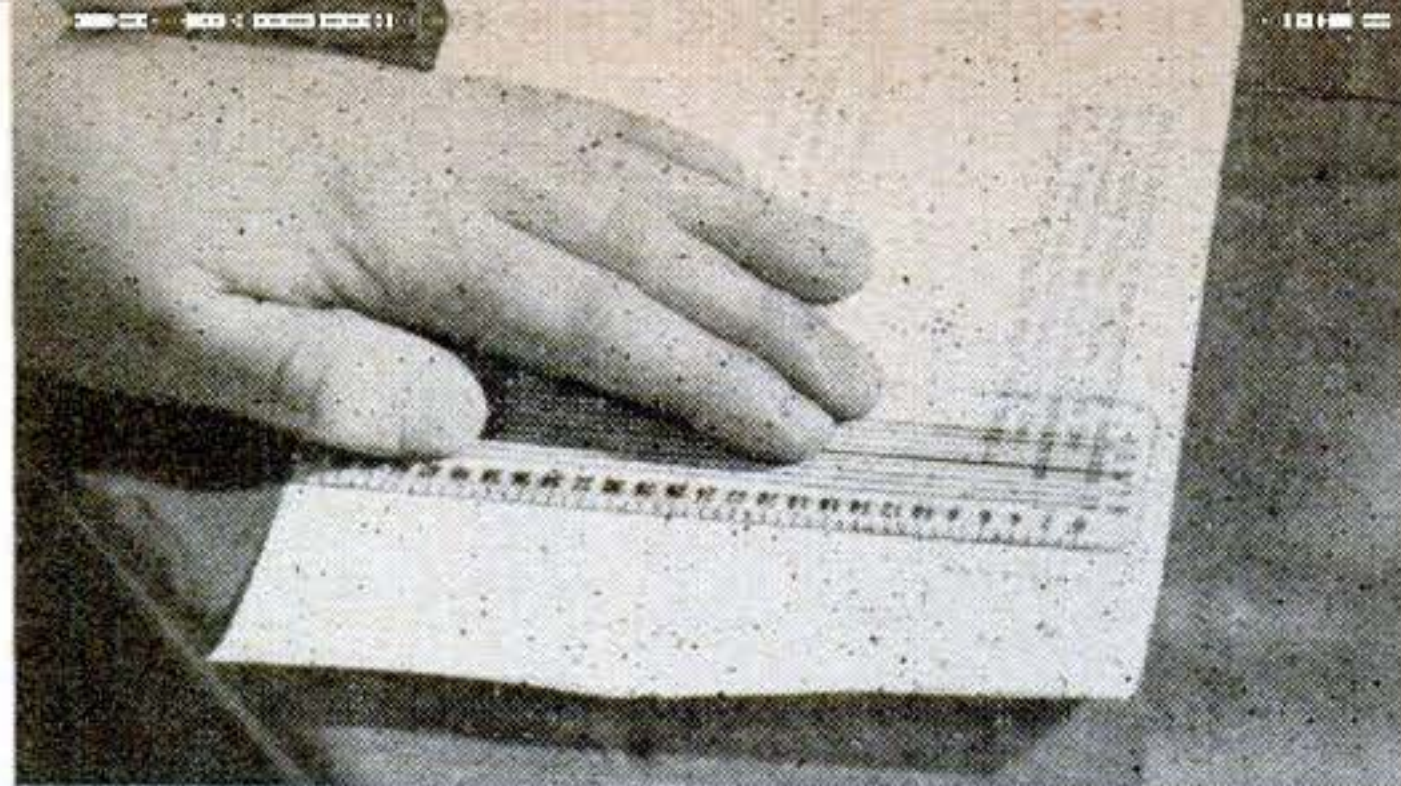
Margin aligner attaches to carriage of most standard typewriters. Here, cord on roller at end of justifying lever is threaded through a notch numbered for column width you want.

Typewriter Slips On Purpose

NOW you can type copy with an even right-hand margin—handy if you want to reproduce it by photo-offset—right on your regular typewriter. This device, attached to the carriage, varies the space between letters and words to make each line the right length. It works by letting the typewriter carriage slip just the right amount each time a key is struck.

Copy is first typed to within four spaces over or under the desired width. The amount each line must then be stretched or shrunk is found by laying a transparent scale over the draft copy.

On a second typing, the Marginator® is used. The column width for the entire piece of copy is first set by threading a cord

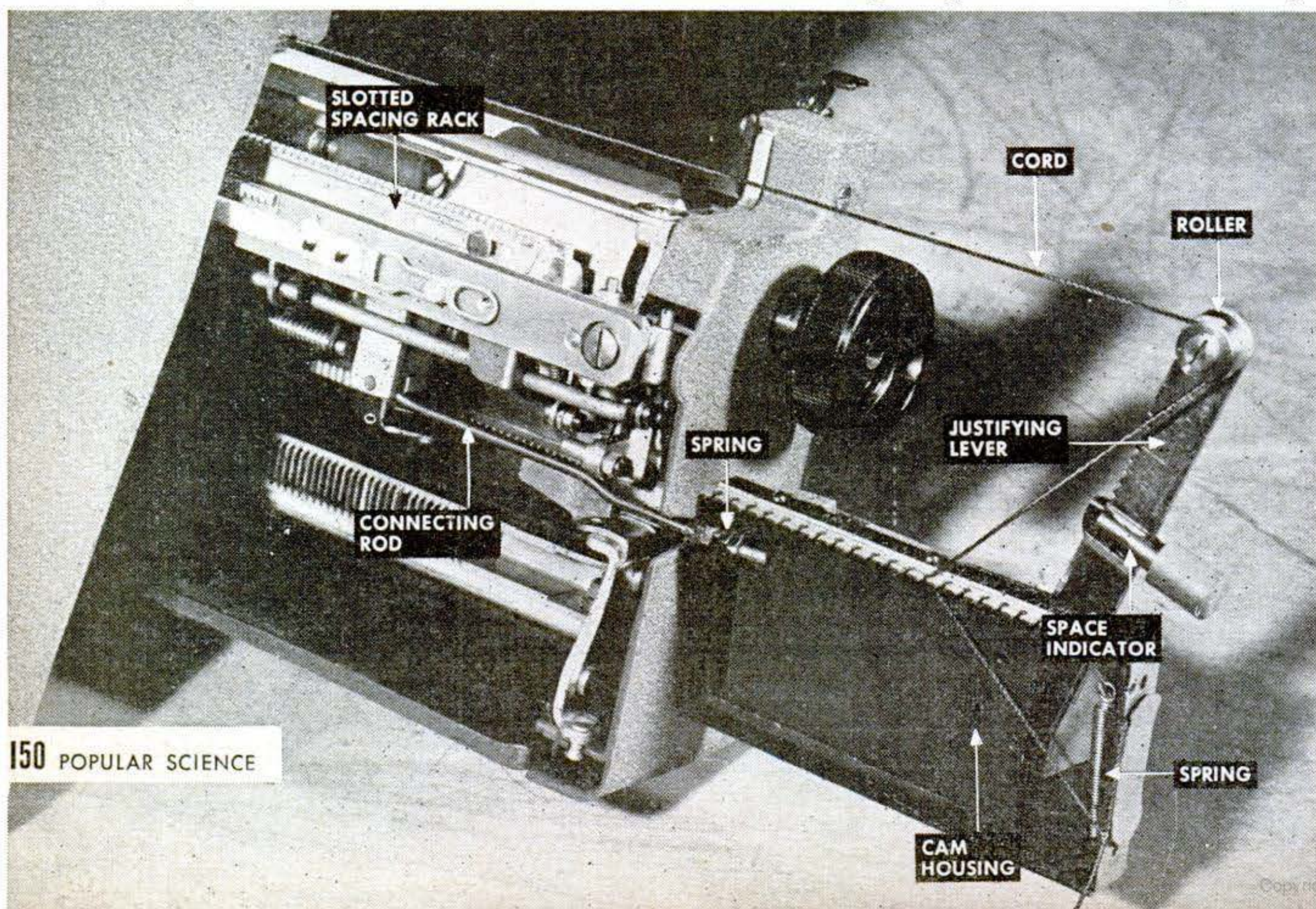


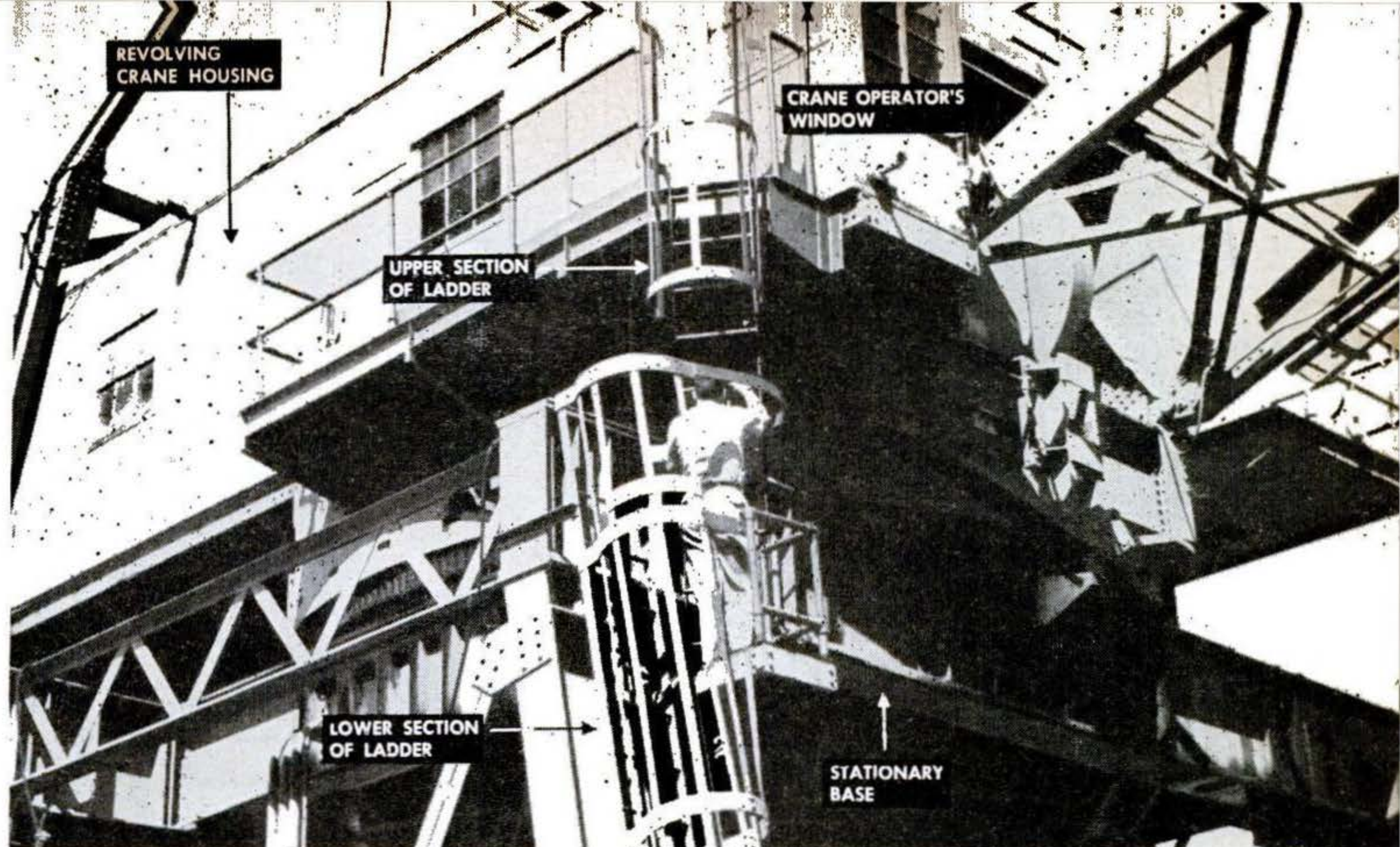
Second adjustment is made by sliding shorter lever to amount each line must be expanded or shrunk. You have already found this by measuring draft copy (top) with transparent scale.

through one of a row of notches. Then, for each line, the space indicator is set for the number of adjustment units needed.

These two adjustments affect the movement of a cam, at the end of the justifying lever, that sets the tension of two springs. These springs govern how far the toothed spacing rack under the carriage will slip to the left or right in its slot during the typing of each line—and, thus, the length of the line.

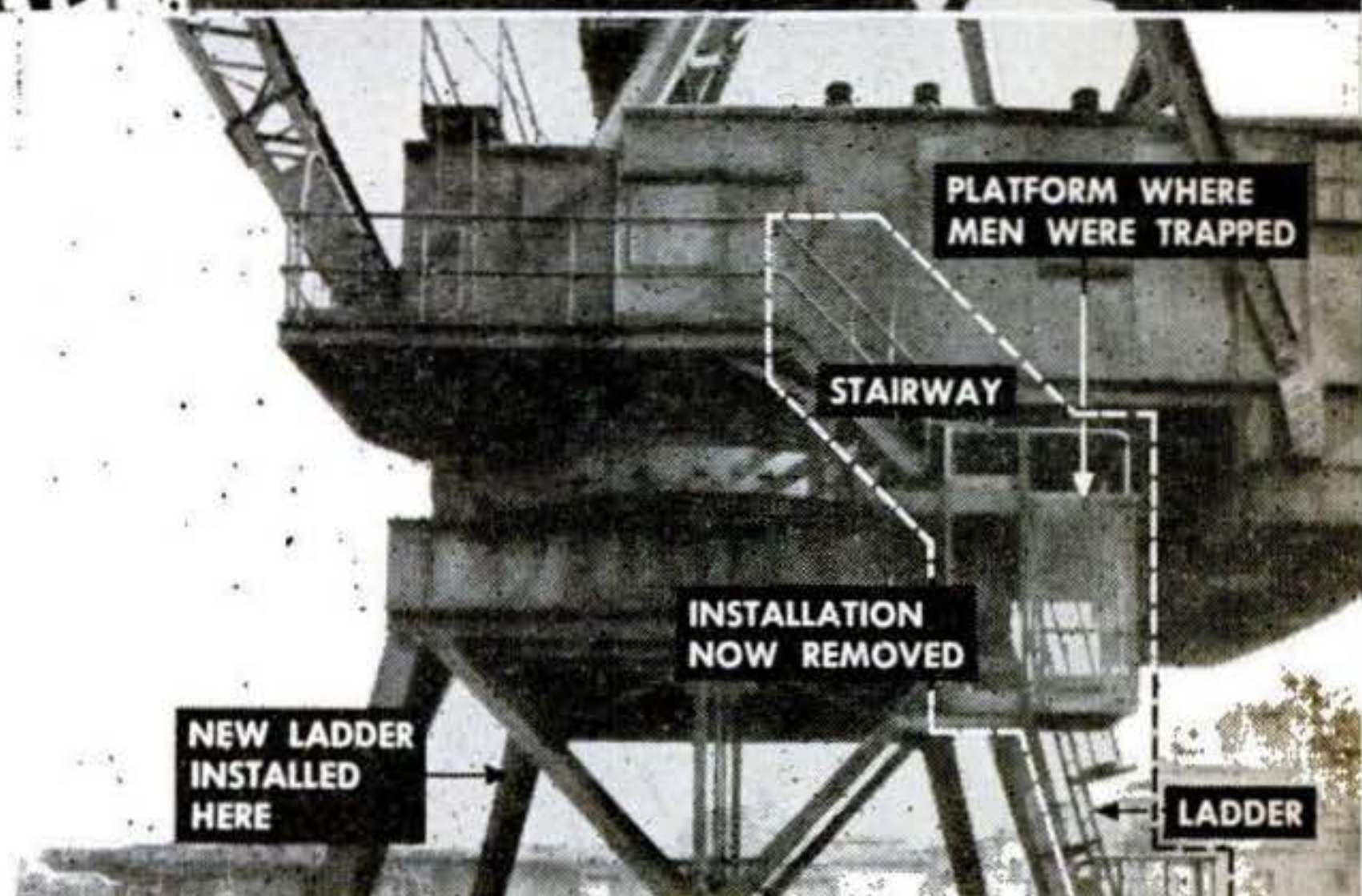
View (below) of device from underneath shows how slot in spacing rack lets it slip sideways.





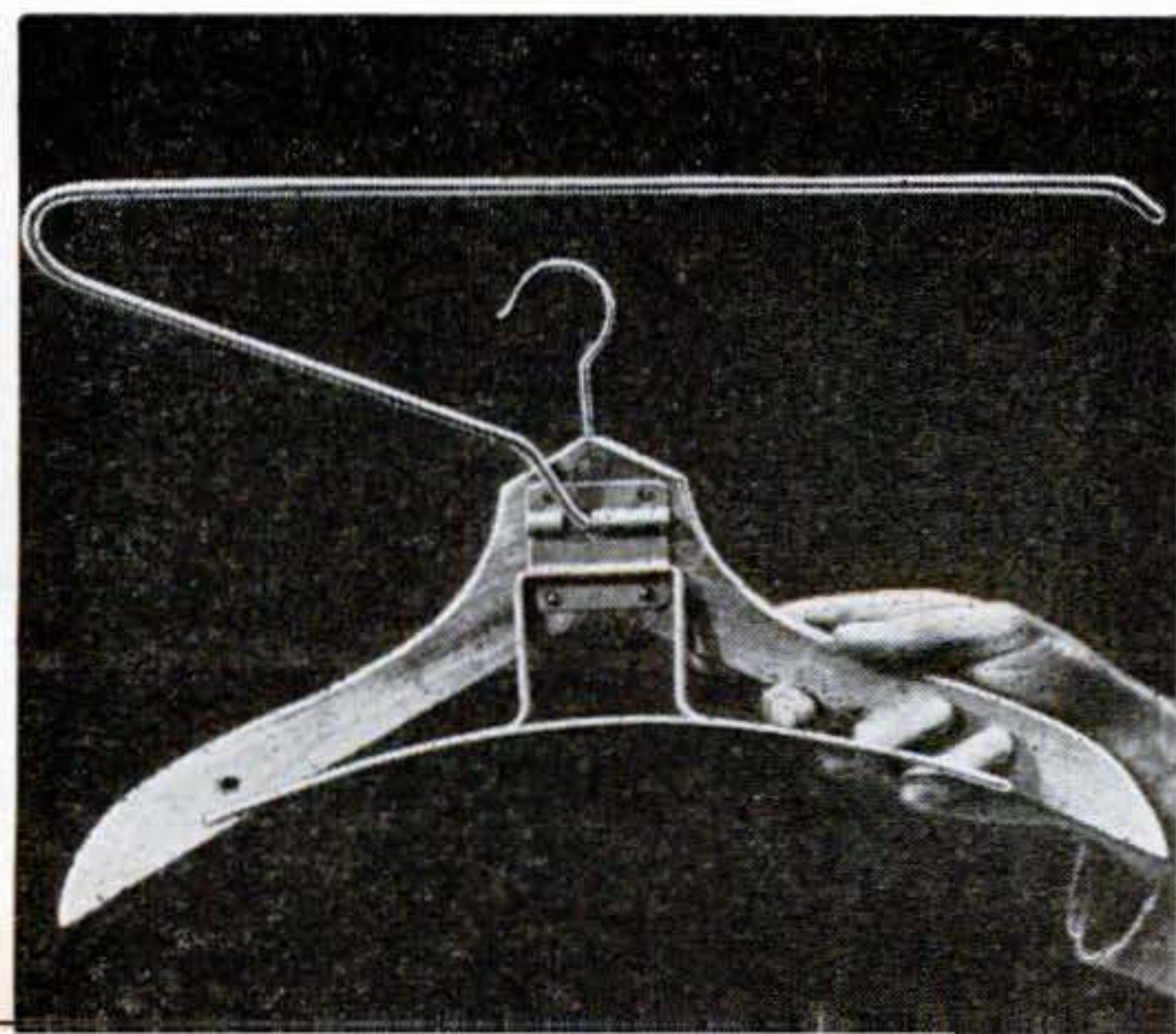
Crane Gets Safe Ladder

THE workman in the picture above is climbing into a 25-ton Navy crane on a new safety ladder. One caged section is attached to the crane's stationary base; the other, to the revolving housing. The man can mount from one to the other only when they are aligned and in sight of the crane operator. This ladder replaces the installation shown at right. With that, several men had been injured when the crane swung against them while they were trapped between the lower ladder and upper stairway.



Hangs 3-Piece Suit in 1

A NEW British clothes hanger, shown below, solves the problem of how to hang your trousers on the same hanger with your vest and jacket without knocking them off. Its separate rods for both the vest and trousers simply lift up until you need them in the natural order of undressing.



Mop Scrubs and Rinses

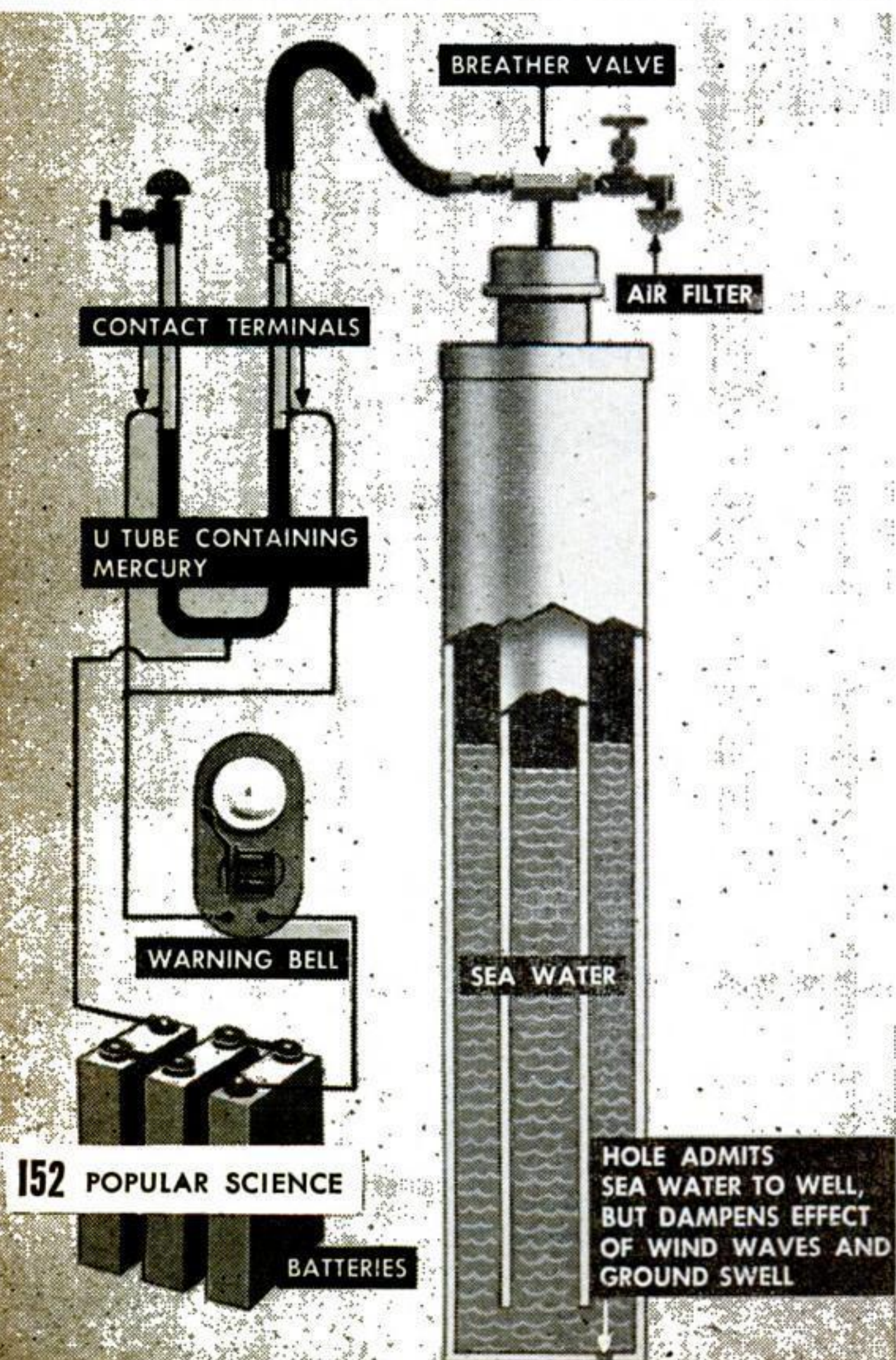
THIS garden-hose attachment (below) speeds washing a car or windows by rinsing as it scrubs. The mop can be replaced with a jet spray for sluicing sidewalks or a pressure breaker for irrigating plants without stooping. The complete set, called Prac-ti-cal Water Sweeper ®, sells for \$2.95.



Squawkbox for Seaquakes

ON APRIL 1st, 1946, 54-foot waves swept in without warning on the Hawaiian Islands. When the waters withdrew, as shown above at Kahuku airfield, they left 173 dead and \$25,000,000 damage.

Sketch below shows how sea-wave detector works. Air pressures slowly built up in the well by normal tides escape through tiny breather valve. This valve cannot handle pressures caused by the comparatively rapid rise and fall of water level characteristic of seaquake waves. Thus blocked, these cause a rise and fall of mercury in U-shaped tube, sounding alarm when terminals make contact through mercury.

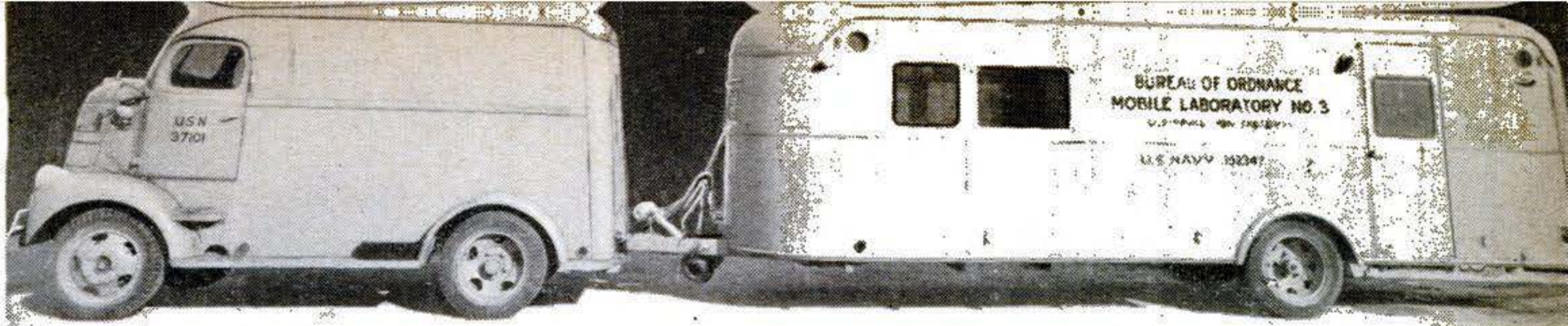


Such huge waves are caused by earthquakes in the sea floor. Racing across the open ocean at 600 m.p.h. the seismic waves flatten out so that they pass ships and aircraft unnoticed. Only when they hit shallow water do they rear up—and smash down.

Now, however, the U. S. Coast and Geodetic Survey is planning to spot these monsters at birth. First, seismographs, spotted at strategic Pacific points, will pick up any submarine quake. Coasts near the quake will be alerted by radio. In these areas the new wave detector at left will sound the alarm when the sea movement that runs ahead of the main wave is felt. This movement, in which the water rises several feet in a few minutes, frequently goes unnoticed, but arrives at least 17 minutes ahead of the quake wave. This gives people near the wave alarm barely enough time to run for the hills. Flashed to the earthquake center at Hawaii for broadcast, however, the warning gives exposed areas at a distance several hours to evacuate their coasts and send ships to sea before the death-bearing wave arrives.

This map of the Pacific shows where the warning detectors now under development might be installed. Such a system would alert the Hawaiian Islands hours before sea waves struck.





Navy's mobile laboratory unit takes instruments right out to pits where rockets are tested.

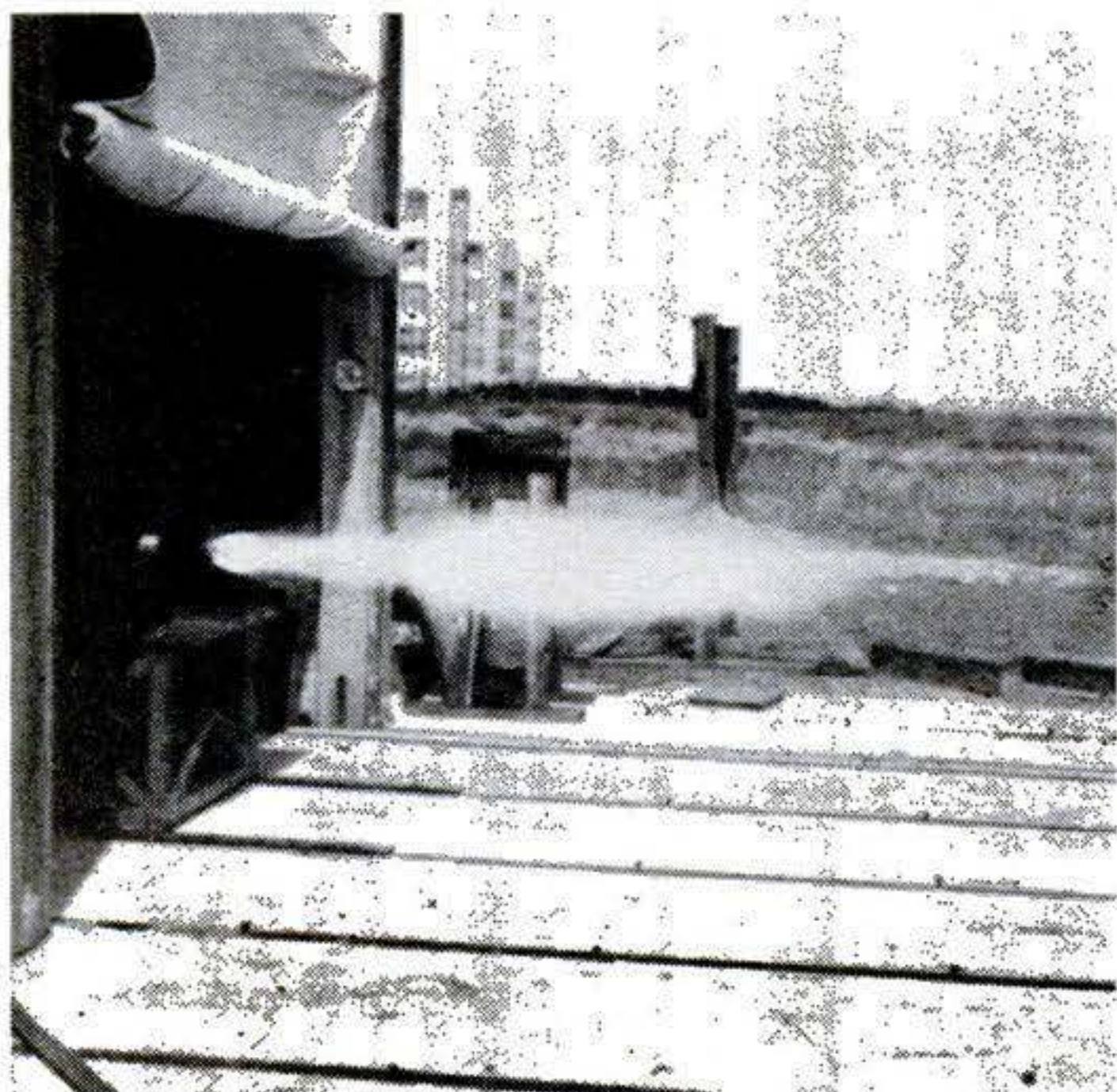
Lab-on-Wheels Speeds Rocket Tests

THE Navy can now take a complete laboratory right out to the rocket test pits. Inside a specially built truck and trailer, instruments and photographic processing equipment turn out a full report on rocket-motor experiments—within a few minutes after the firing is over. They start working at the push of a single button.

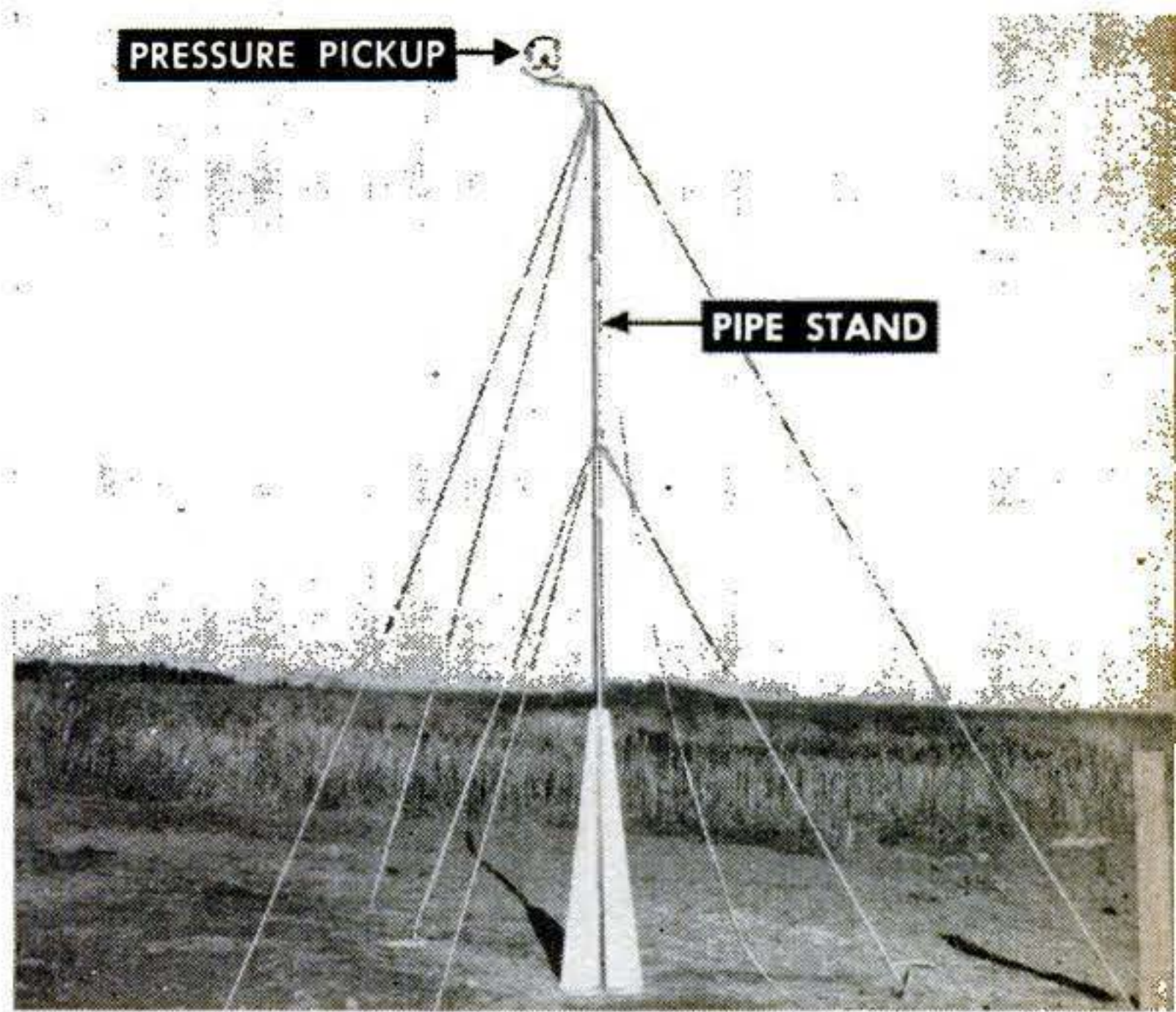
Because of the noise and danger, the test pits are generally located some distance from

any permanent building. Previously, instruments were set up on the ground near the pits, and their records—usually on photographic film—had to be carried to the nearest laboratory before results were known. Now the whole job is done right on the spot, with considerable saving in time and effort.

The mobile unit, designed and built at the Naval Gun Factory, in Washington, now carries everything needed.



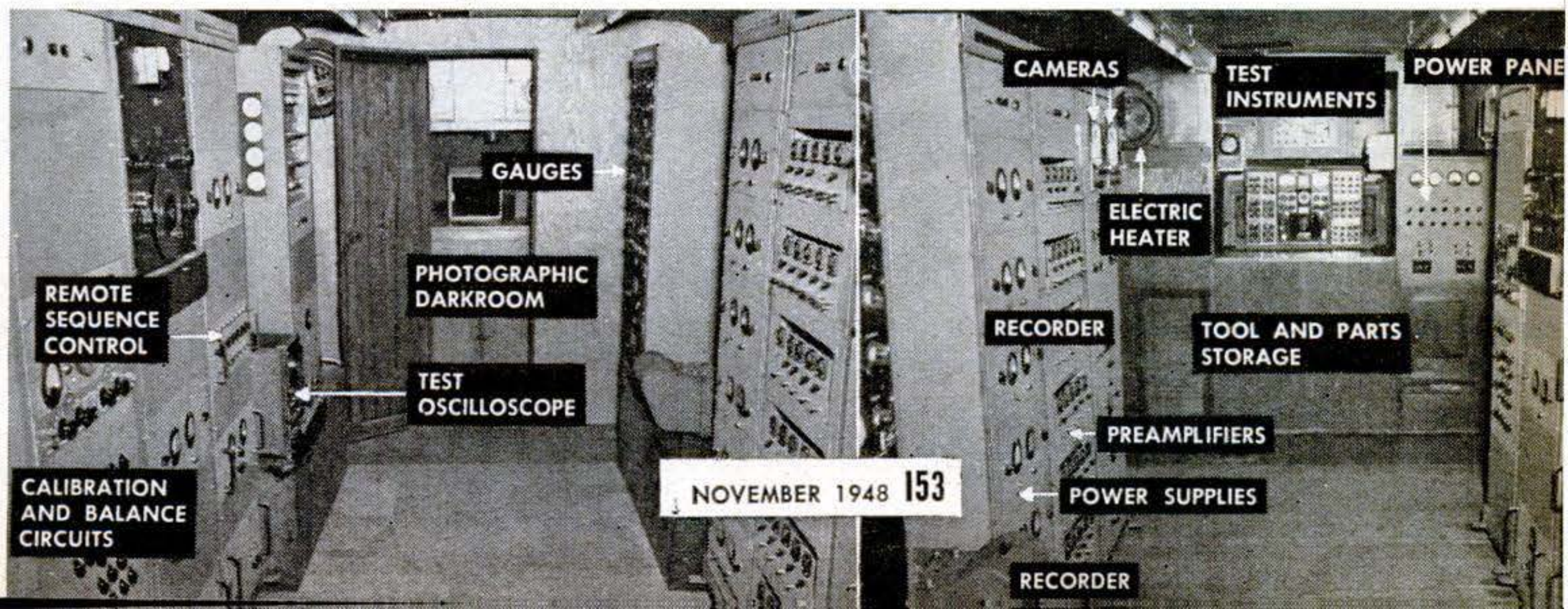
Rocket motors are tested in shelter or pits made of heavy concrete. The motor being fired above is held in a specially designed dynamometer, which measures its power output.

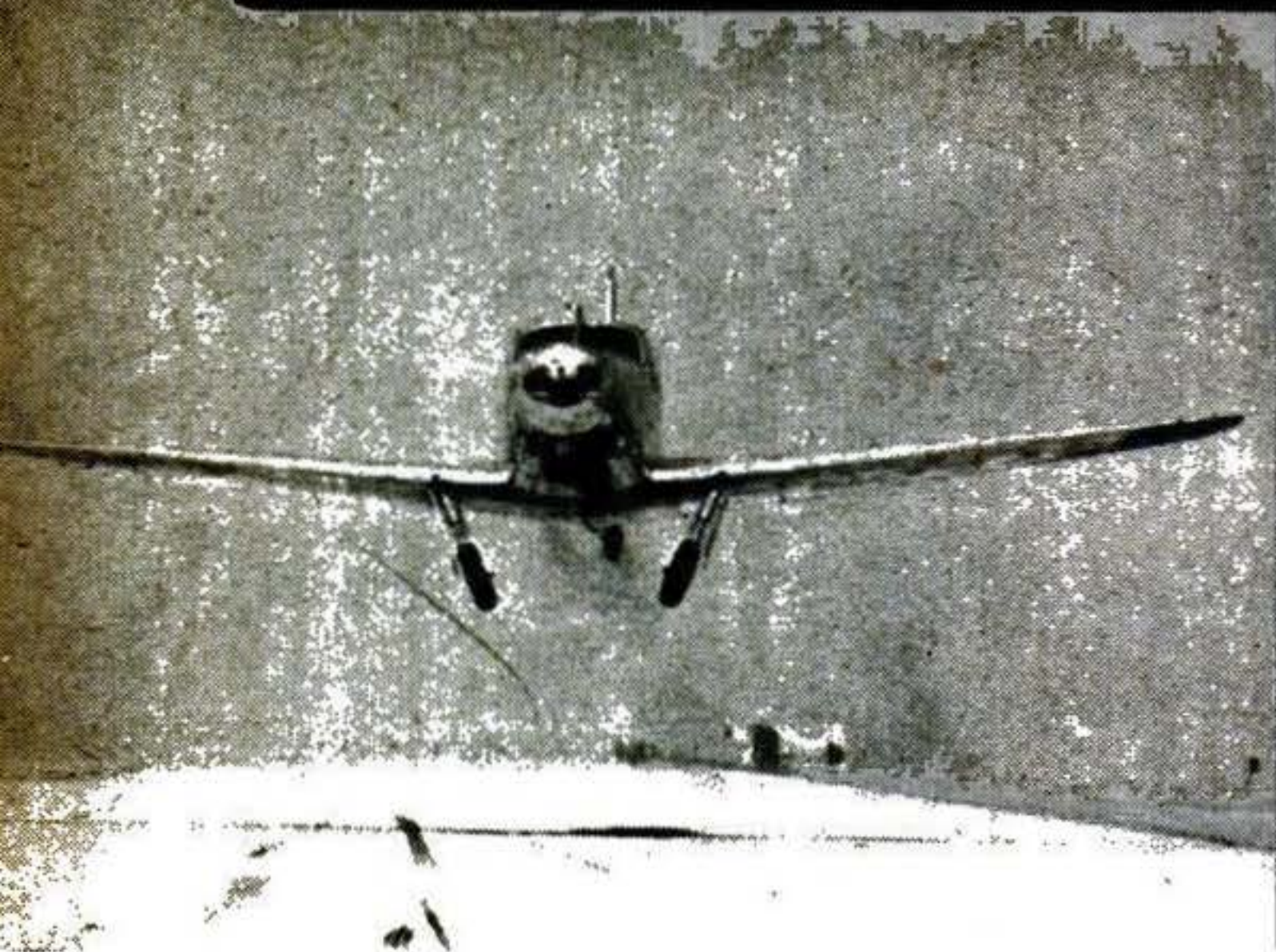


Pickup mounted on tall stand detects pressure variations at a distance from rocket flame. Other instruments measure temperatures, radiated energy, sound energy, shock waves, torque, etc.

Signals from dynamometer, pressure pickup, and other instruments are fed to multi-channel oscillographs inside trailer (below) and recorded on film. Films are developed in darkroom

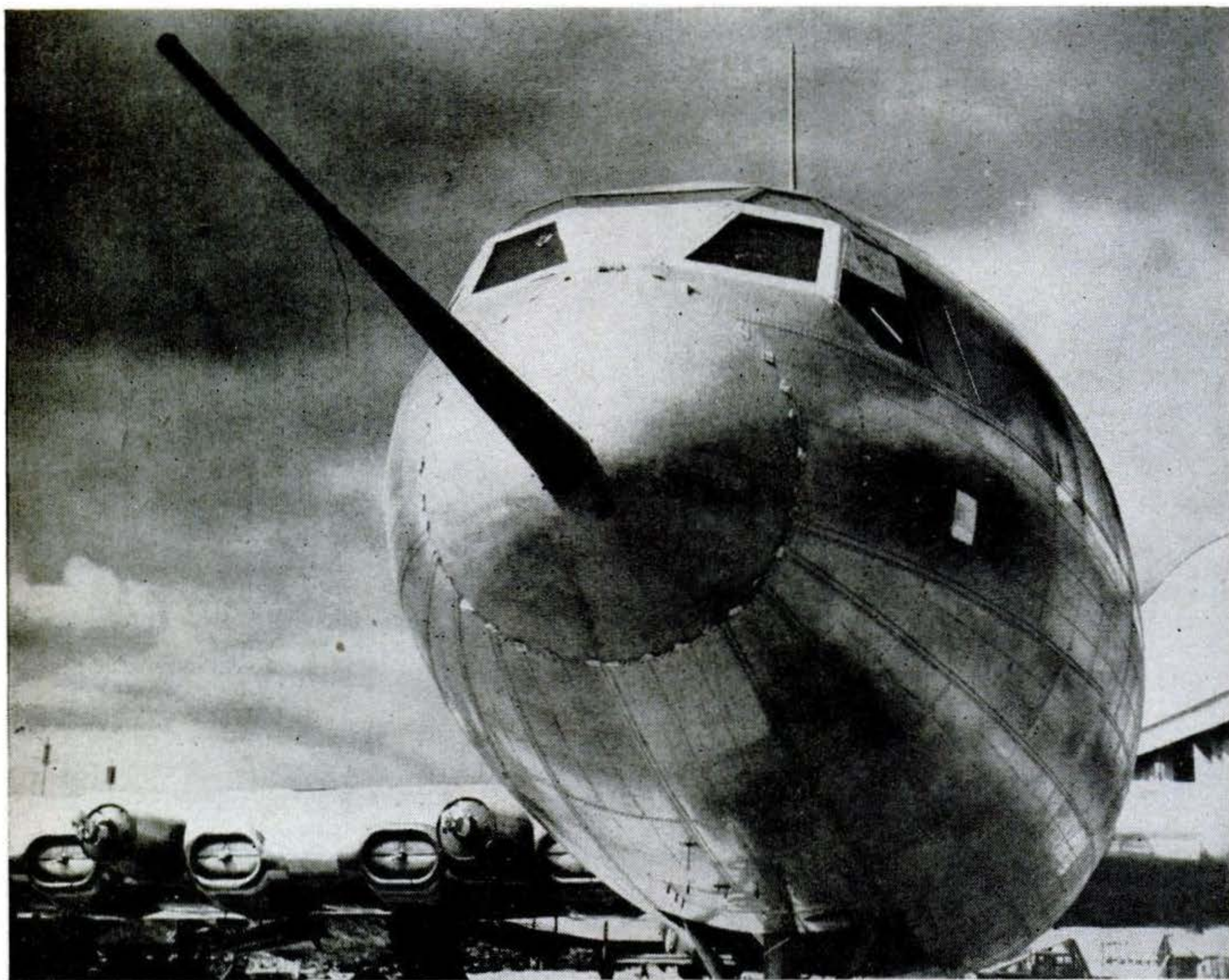
built in trailer. Results are expected to explain how to use gases to launch rocket, how to vent gases from the launchers, and how the rocket blast affects outer surfaces of aircraft.





Light Plane's Wheels Fold. Retractable landing gear, unusual in a low-priced plane, is shown in operation, at left above, as the new four-place, all-metal Atlas takes off. The plane also has a con-

trollable-pitch propeller. Its large tail assembly increases controllability. The photo at right shows how large doors provide access to front and rear seats. The 170-m.p.h. plane sells for \$2,995.

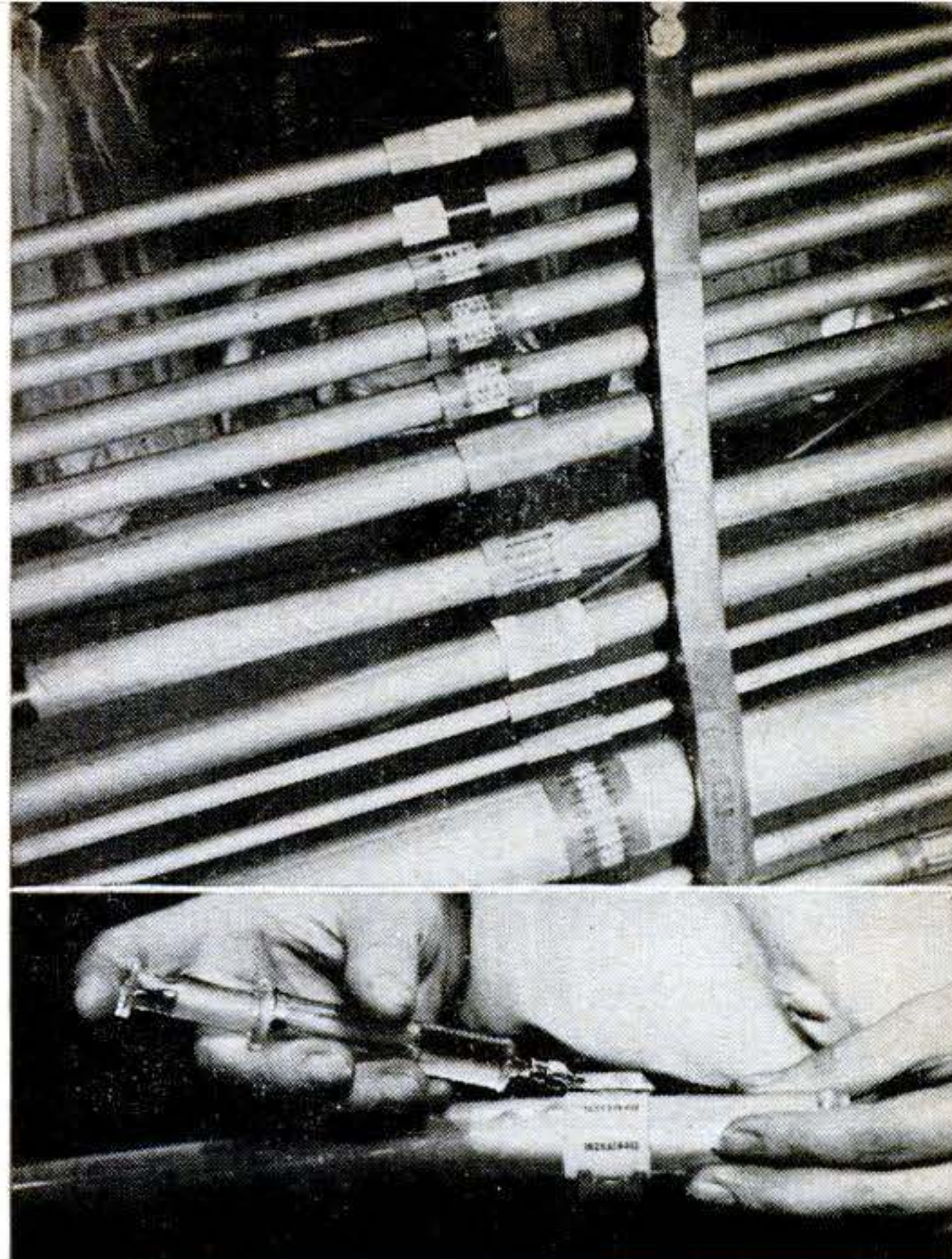


Meet Britain's Biggest. Out of its hangar for the first time, the 130-ton, \$24,000,000 Bristol Brabazon I is nosed into position for calibration tests of its instruments. The land-based giant is 175 ft. long

and has a wing span of 230 ft. Powered by eight reciprocating engines, it is scheduled to fly this month. Eventually, it is to have eight jet engines. The plane, one of two on order, will carry 100 passengers.



Plane Snaps Shock Waves. As turbulences approaching the speed of sound rush through the air channel shown above on the wing of an F-51 Mustang, they interfere with parallel beams of light. The resulting patterns are photographed by a camera in one of the fairings forming the channel. By using this adaptation of Schlieren apparatus, NACA engineers at California's Ames Aeronautical Laboratory hope to learn more about making airplanes fly faster than the speed of sound.



Tubes Marked Permanently. This tubing installation, buried inside a modern commercial plane, shows each tube identified by a new permanent plastic sleeve. It was developed by the Glenn L. Martin Co. to replace an adhesive that sometimes softened and came loose. Colors of the sleeves indicate contents of tubes; printing on them tells the direction of flow and where it goes. The bottom photo shows a worker sealing one of the new plastic sleeves with acetone from a hypodermic needle.



Tilting Wings Aid Flight. Faster take-offs and slower landings are made possible by a wing-root pivoting device that tips up the wings of this British Vickers Viking Seagull amphibian. For cruising and high-speed flight, the wings are returned to their normal angle. Designed for spotting, training, and air-sea rescue, the plane is powered by a Rolls-Royce Griffon engine that drives counter-rotating propellers.



Tank Serves as Fire Truck. Completely equipped for fire fighting and rescue work, this remodeled tank carries grappling hooks to drag fuselages out of flaming gasoline, pneumatic saws to cut through metal, and foam-fog spray to protect personnel in burning planes. Other equipment on the vehicle, developed by the Air Force's All-Weather Flying Center, includes searchlights and two-way radio.

New Machine Simplifies Steel Making

A RADICAL new machine in a little six-story building at Beaver Falls, Pa., recently filled its first commercial order—45 tons of steel billets.

It turns molten steel, for the first time, directly into semifinished shapes. When they leave the mill, they are ready for conversion, by light rolling, into sheets, pipes and tubes, plates, bars, or wire.

For small-scale steel making, traditional steps that require the steel industry's mightiest machinery are eliminated. There's no pouring ingots weighing several tons apiece; no heating them in "soaking pits"; no sending them crashing through the rolls of monster blooming or slabbing mills to knead them to shape.

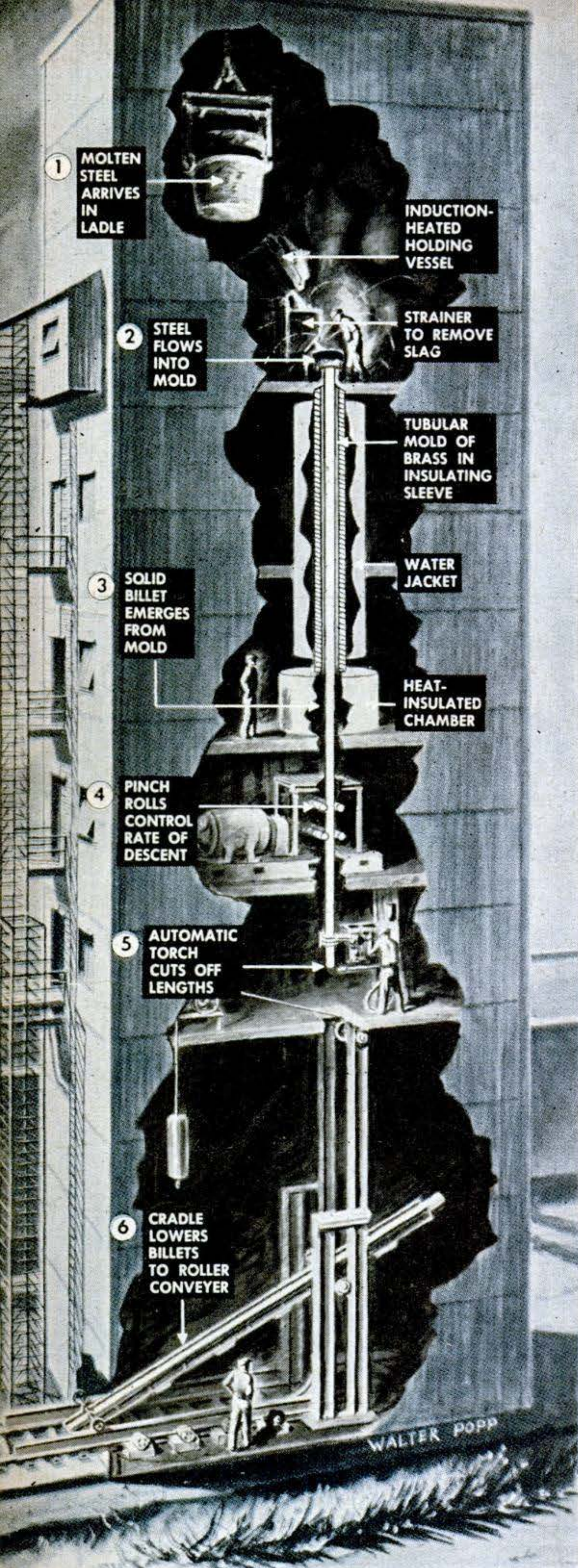
Thus is realized a century-old dream of steel makers—continuous casting. It has been only a dream up until now because of the nature of steel itself: the high heats required, the tendency of slag to mix with the metal, the erosion of the equipment. After six years of research, Republic Steel and the Babcock and Wilcox Tube Company say they have licked the problems.

They have found a way, for example, to regulate the cooling rate in the mold more precisely and have introduced argon gas above the liquid metal to prevent oxidation.

The new machine is actually a vertical production line. Molten steel from the company's regular electric furnaces travels in a ladle to the top of the tower. There it is emptied into a holding vessel heated by electrical induction, then pours into the open upper end of the tubular mold.

Descending through the water-jacketed mold, the metal emerges at the bottom as a solid stick. This is sized and drawn downward at a controlled rate by pinch rolls. Finally an automatic torch cuts the cast stick into uniform lengths.

Using the new process, little plants can now produce steel billets and slabs on a small scale at low cost and capital outlay—decentralizing the industry and adding their output to that of Big Steel.



Forming billets directly from molten steel, continuous-casting machine in 75-foot tower makes light work of a task that has required the heaviest machinery of the steel industry.

STANDARD PROCESS



MOLTEN STEEL

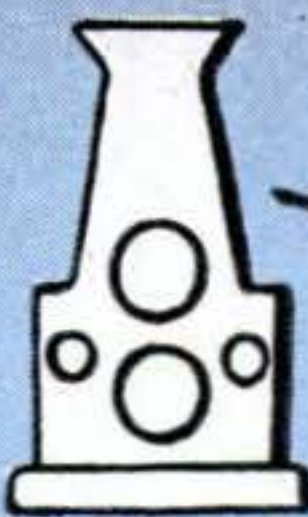


INGOT

INGOT MOLDS



SOAKING PIT



BLOOMING OR SLABbing MILL

SEMIFINISHED PRODUCTS



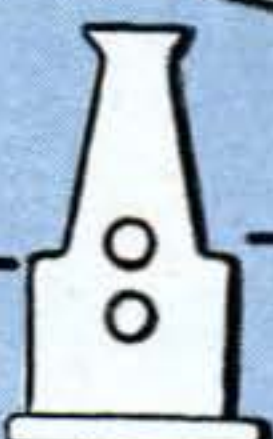
BLOOMS



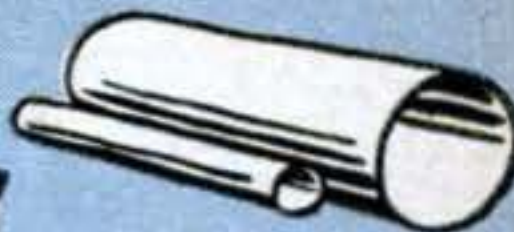
BILLETS



SLABS



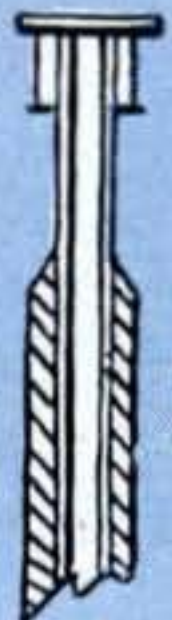
SECONDARY MILL



FINISHED PRODUCTS

(SHEETS, PIPE AND TUBES, STRIP, PLATES, WIRE, ETC.)

NEW PROCESS



CONTINUOUS-CASTING MACHINE

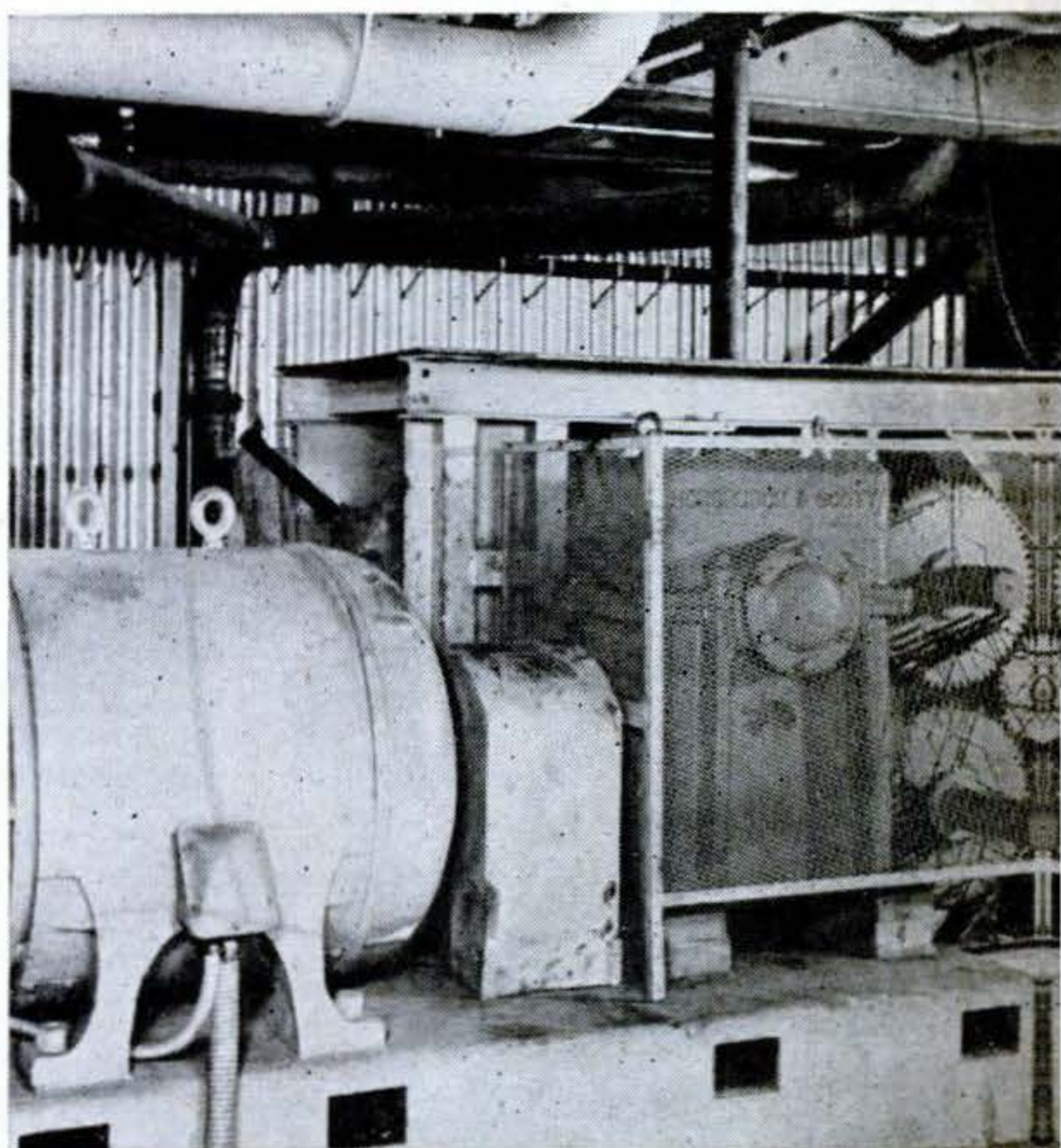
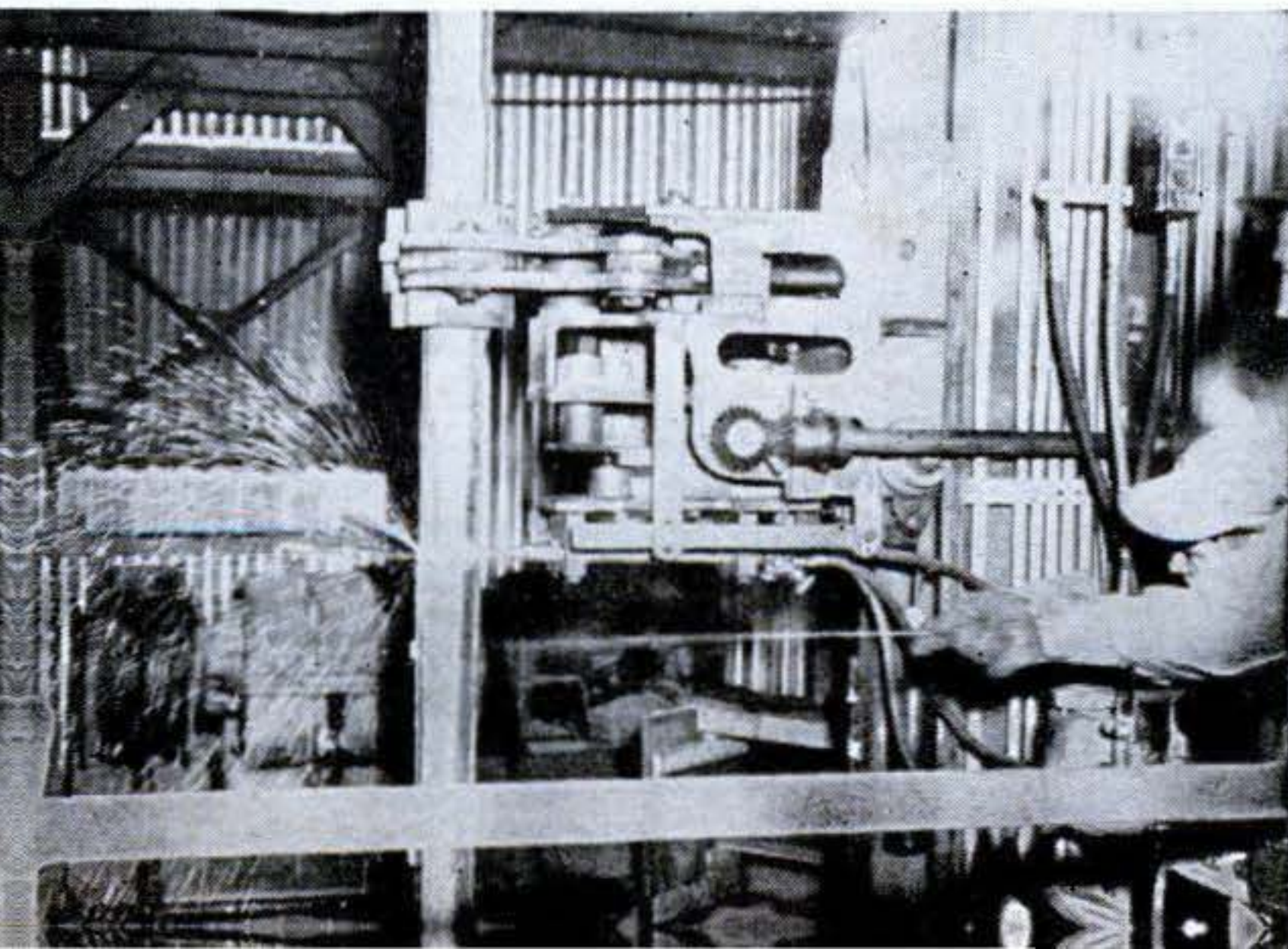
Casting massive ingots, "soaking" them in heat, and shaping them in steel industry's

mightiest mills, are steps eliminated in new short-cut method, contrasted above with old.



Molten steel pours into top end of the vertical mold. A solid billet will emerge from bottom end of mold. (Photo from Iron Age.)

Acetylene torch automatically cuts off billets in easy-to-handle lengths up to 35 feet. A cradle lowers them to horizontal position.



Motive power supplied by pinch rolls draws solidified billet, seen in upper background, from lower end of tubular water-cooled mold.

Typical billet of oval cross section, easy to roll into a "round" or a "flat," is shown below resting on a roller conveyer. (Photo from Iron Age.)

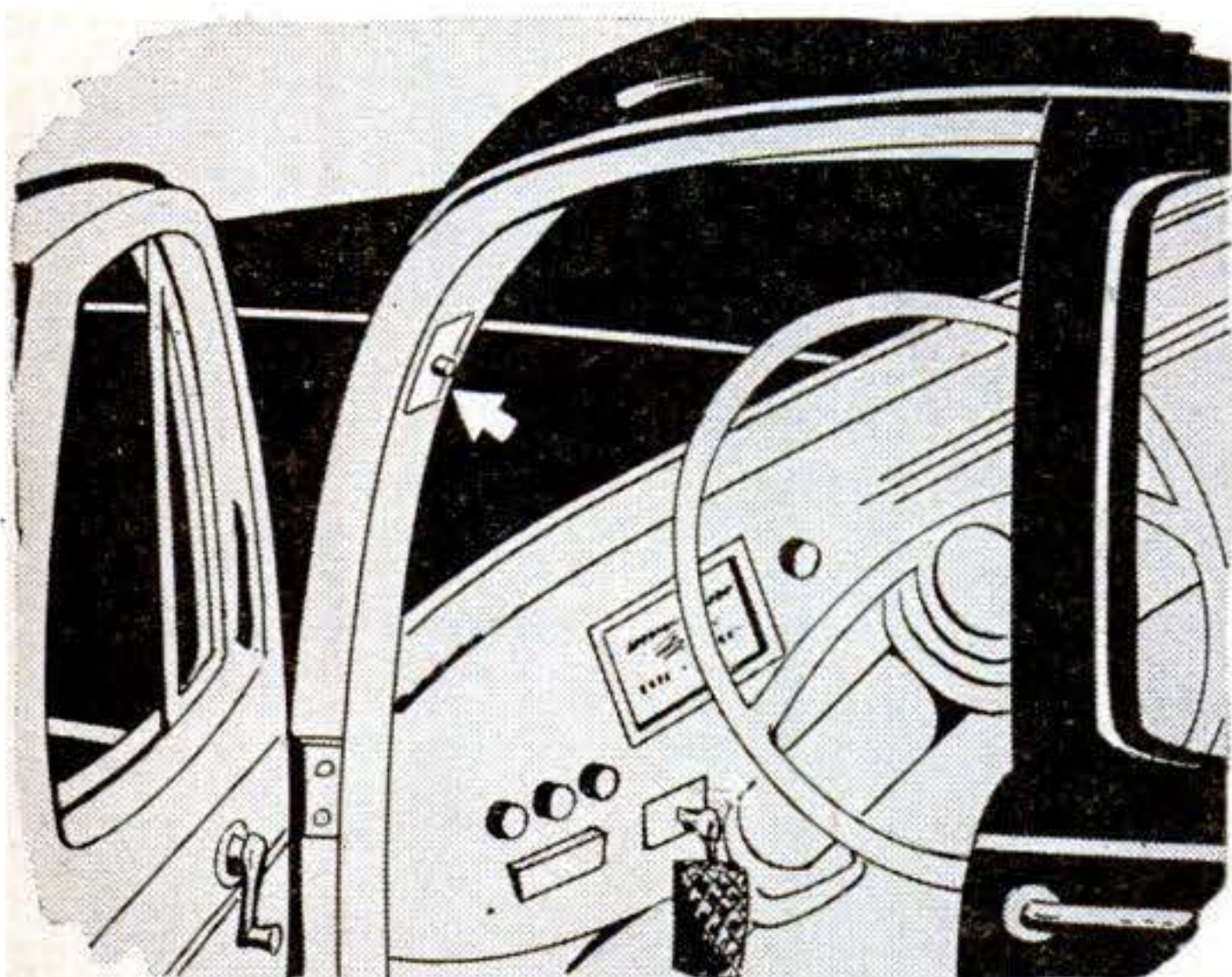


I'd like to see them make...

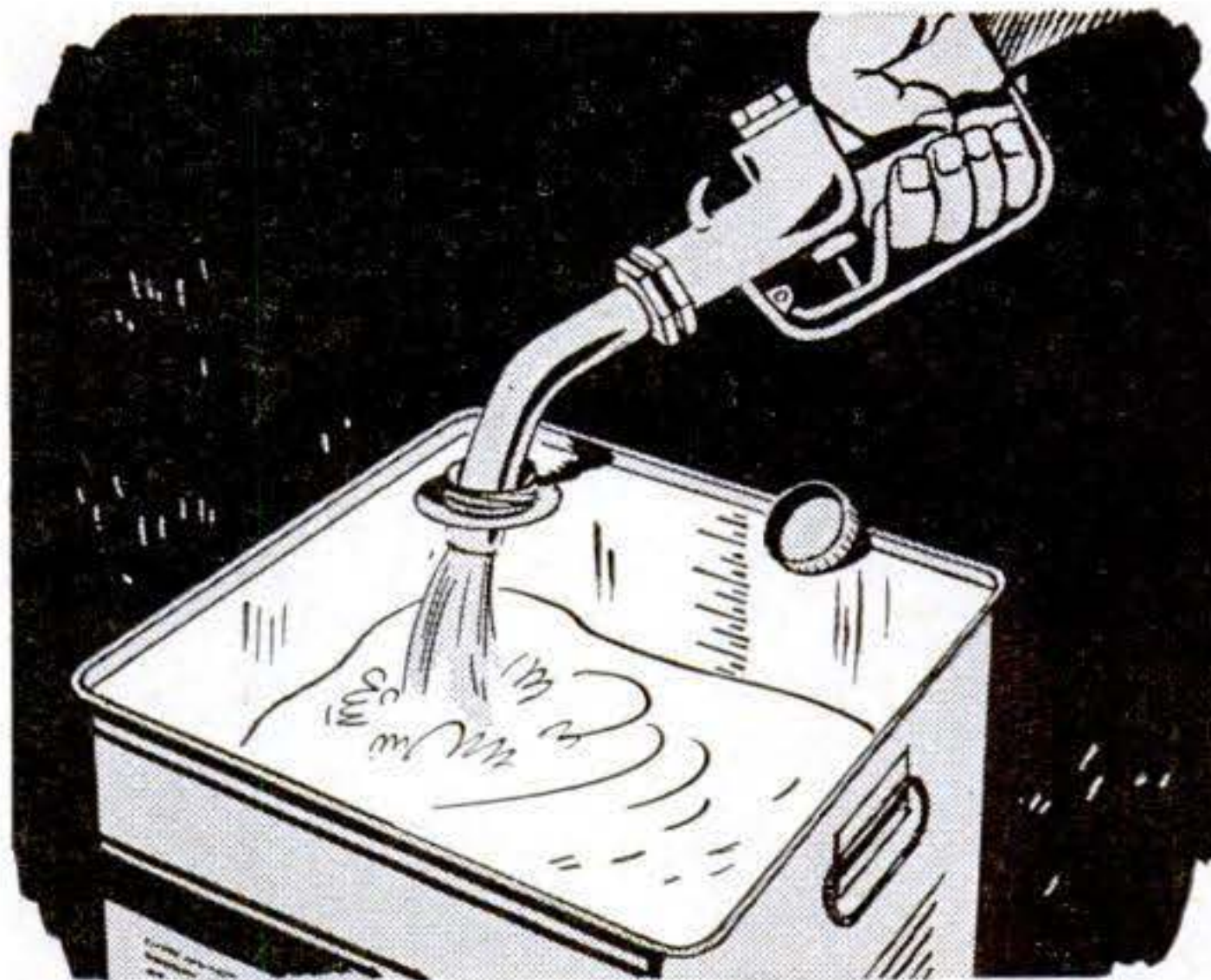
Everybody has his own pet idea of some gadget he would like to see in general use. What is YOURS? Popular Science will pay \$5.00 for each one published. Use government postcards only. Contributions cannot be acknowledged or returned.



Shower curtains with pockets. Many over-the-tub showers are built with only one soap holder. A flapped pocket on the curtain would hold other soap and a brush.—Mrs. T. J. Bianchi, Elmhurst, N. Y.



A warning bell for cars. This could operate off a switch set in the doorframe. If you got out to leave your car with the ignition, lights, or radio on, the warning would sound.—Donald Smith, Belle Vernon, Pa.



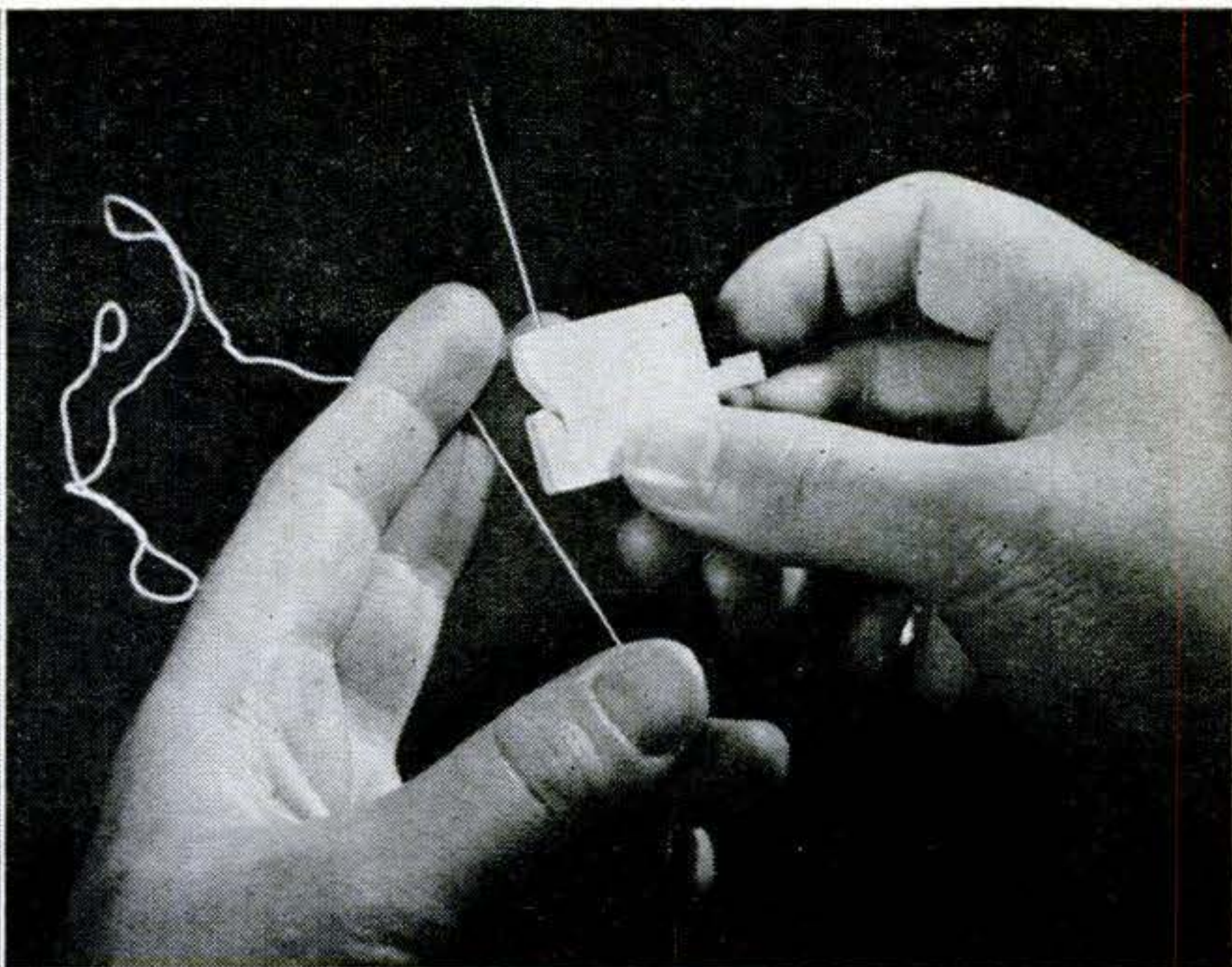
Fuel cans with transparent tops. If large oil and gasoline cans had clear plastic tops, you'd never have to worry about overflowing when you were filling them.—Theodore Kapka, Chicago, Ill.



Telephones with pencil holders. Telephones could be made with a groove down one or both sides to hold pencils. Then a pencil would always be handy when and where you needed it.—James Wilson, Manhattan, N. Y.



Finger guards for housewives. Slip-on guards of light leather or plastic would save a housewife's fingertips when she has to use the grater for fruits, vegetables, or other food.—Mrs. G. Olshenske, Pittsburgh, Pa.



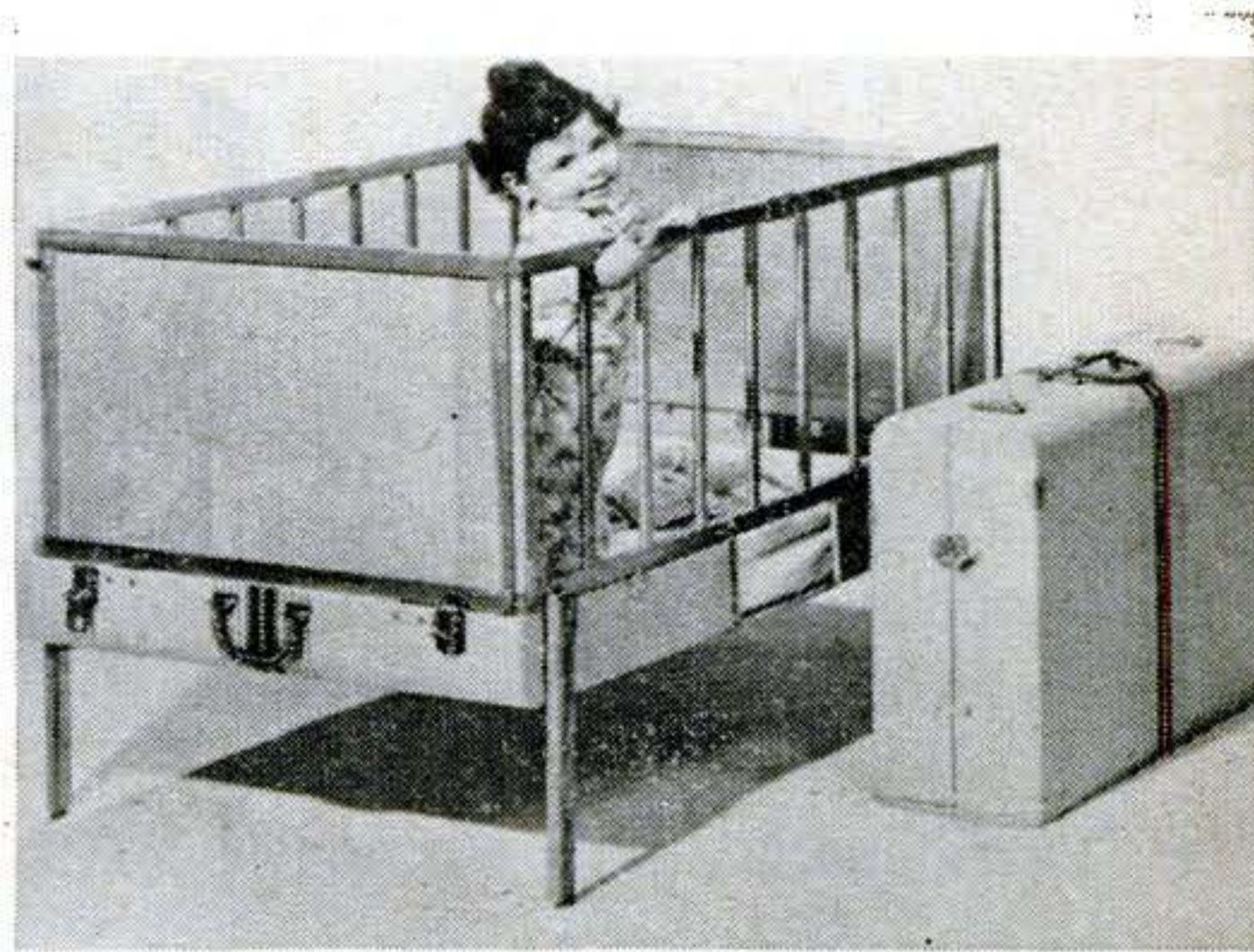
Needle Threaders Save Eyesight and Tempers

ANY man who has ever sewed on a button knows that the toughest part of the job is getting the needle threaded. That's easy now, with one of these new devices to do it without strain on your eyes or temper.

The essential parts of both threaders are a hole into which the needle is dropped with its eye down, a slot to slip the thread into, and a tiny hook that reaches through the eye and then pulls the thread through as it is withdrawn.

The threader shown at left above, made by the W. C. Burroughs Co., of Wilton, Conn., measures 3 by 3¼ by 3 inches, and has a sharp-edged piece of metal at the side for cutting a length of thread off a spool. Its hook is operated by pushing a button.

The threader at right above, only 1 1/16 in. by 7/8 in., has its hook on the end of the push-pull lever seen near the right forefinger of the user. A. E. Edwards, Inc., of New York City, makes it.



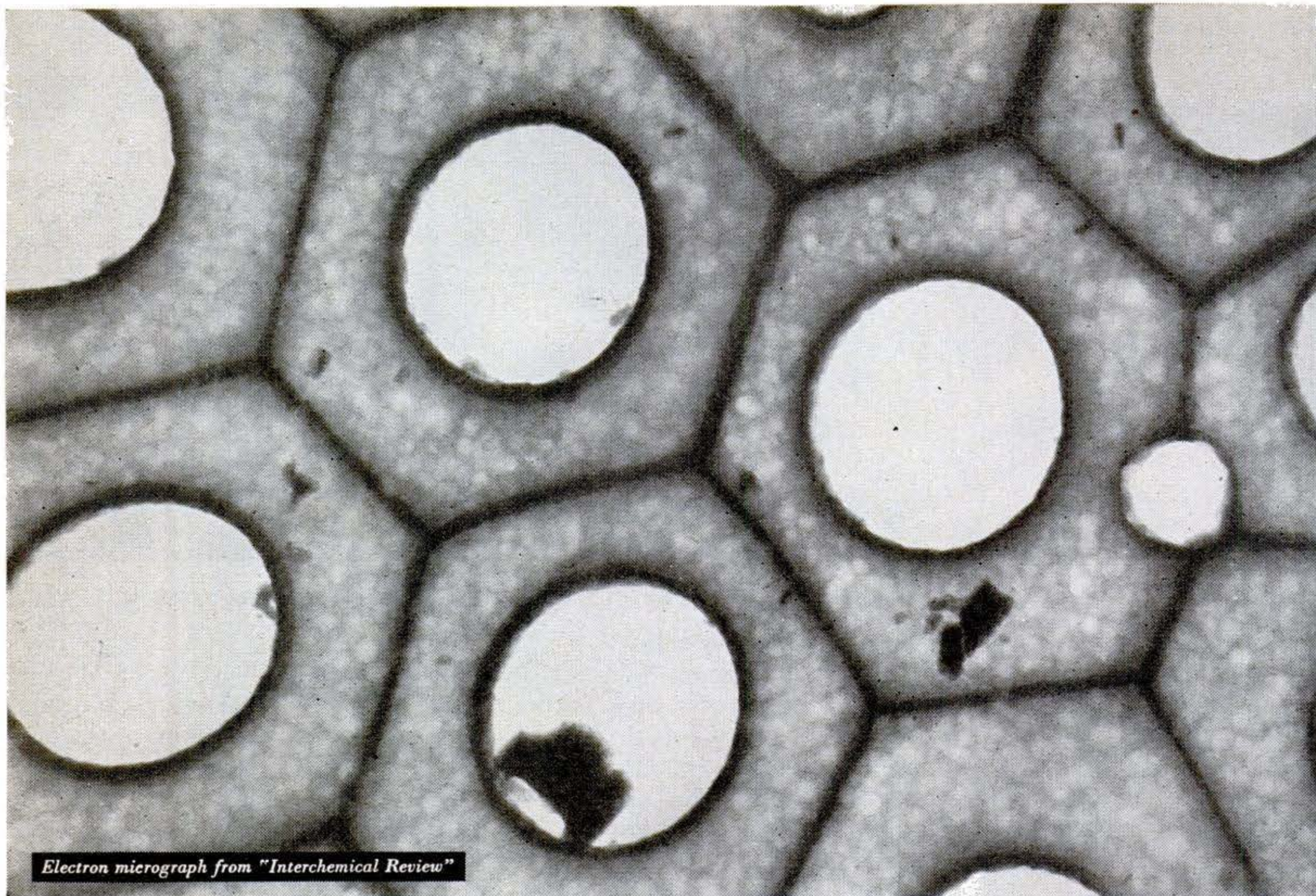
Folding Cribs Ease Traveling with a Child

EITHER of these two portable cribs simplifies the problem of taking Junior with you on overnight trips. Both can double as play pens as well as beds.

The Sleepy-Tot®, shown at left, is nothing more than a frame with hooks and adjustable straps to hold it to any bed. Hinges at the corners and in the center of the end frames let you fold it flat by pushing in the ends. The straps then make a handle by

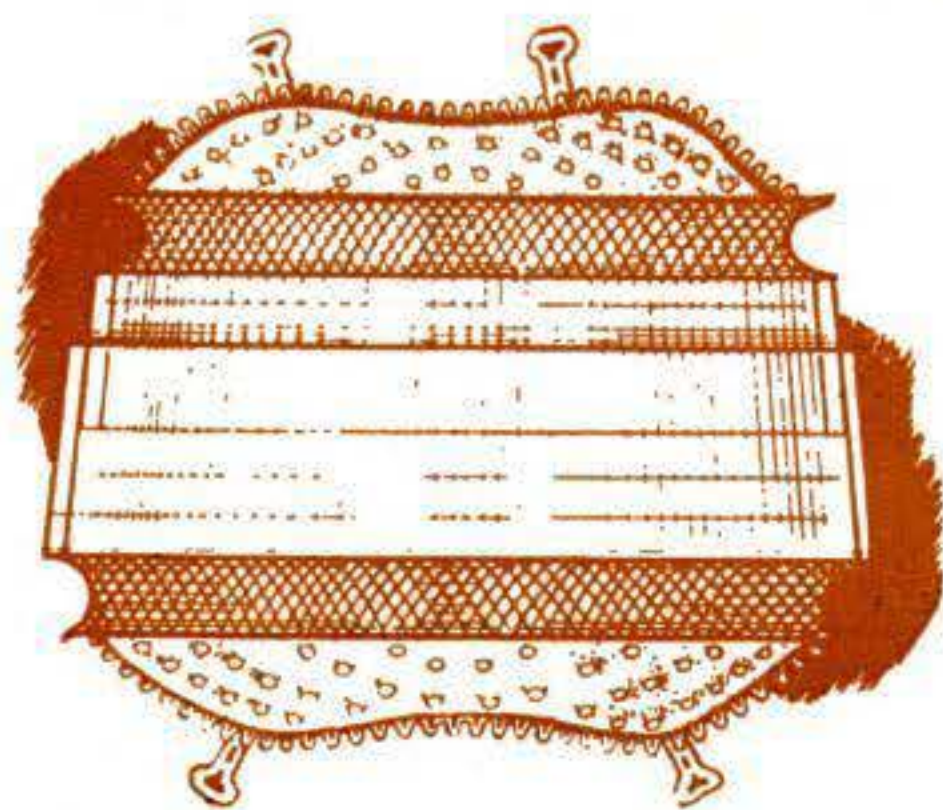
which you can carry it with one hand. The crib weighs only 8 lb. and retails for \$10.95.

The Travel Crib®, above, opens out in 45 seconds from a 29-in. suitcase (right). The carrying case then forms the bottom of the bed and supports a mattress 48 in. long and 29 in. wide. For use as a play pen, the crib is lowered to the floor by folding up the legs. Made of plywood, with locking catches, it sells for \$59 with mattress.



Electron micrograph from "Interchemical Review"

Pores in slice of diatom skeleton are plainly visible (above) when magnified 20,000 times. Enlarged drawing at left shows jewel-box structure of whole diatom—one of 10,000 known shapes.



Old Skeletons Fill New Jobs

Fossilized shells of microscopic plants that lived 50,000 centuries ago work wonders for modern industry in making products you use every day.

By Andrew R. Boone

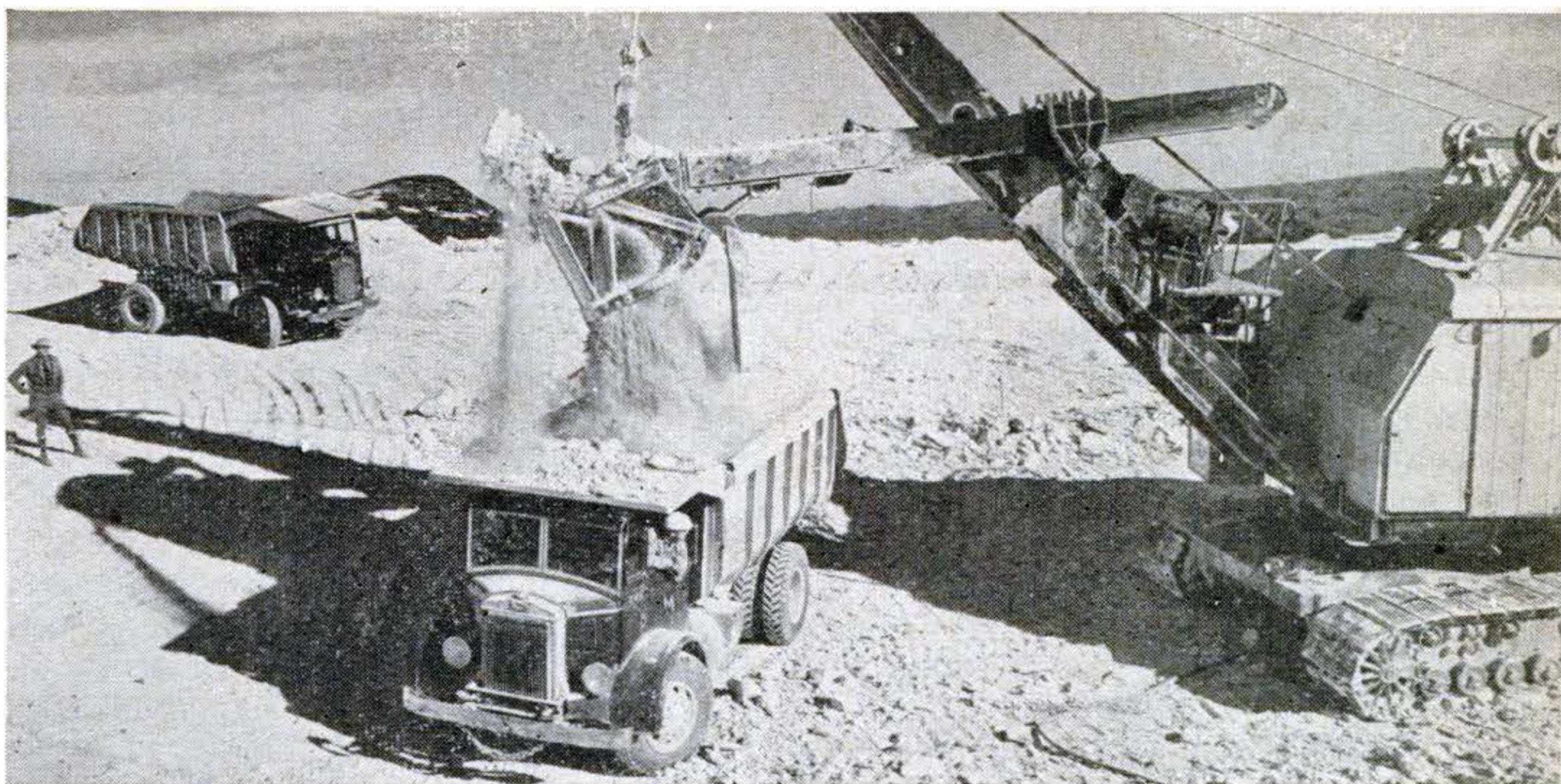
TINY water plants that lived and died five million years ago are one of the most useful materials of American industry.

Their skeletons, more beautifully intricate than snowflakes yet so small that a billion of them would barely fill a pint jar, do literally thousands of diverse jobs in modern industry. They make blotting paper more absorbent. They prevent afterglow in matches. They cut the cost of gasoline, deaden sound in dance halls, take the shine out of paint, put added sparkle in your beer.

The list could easily go on to fill this page.

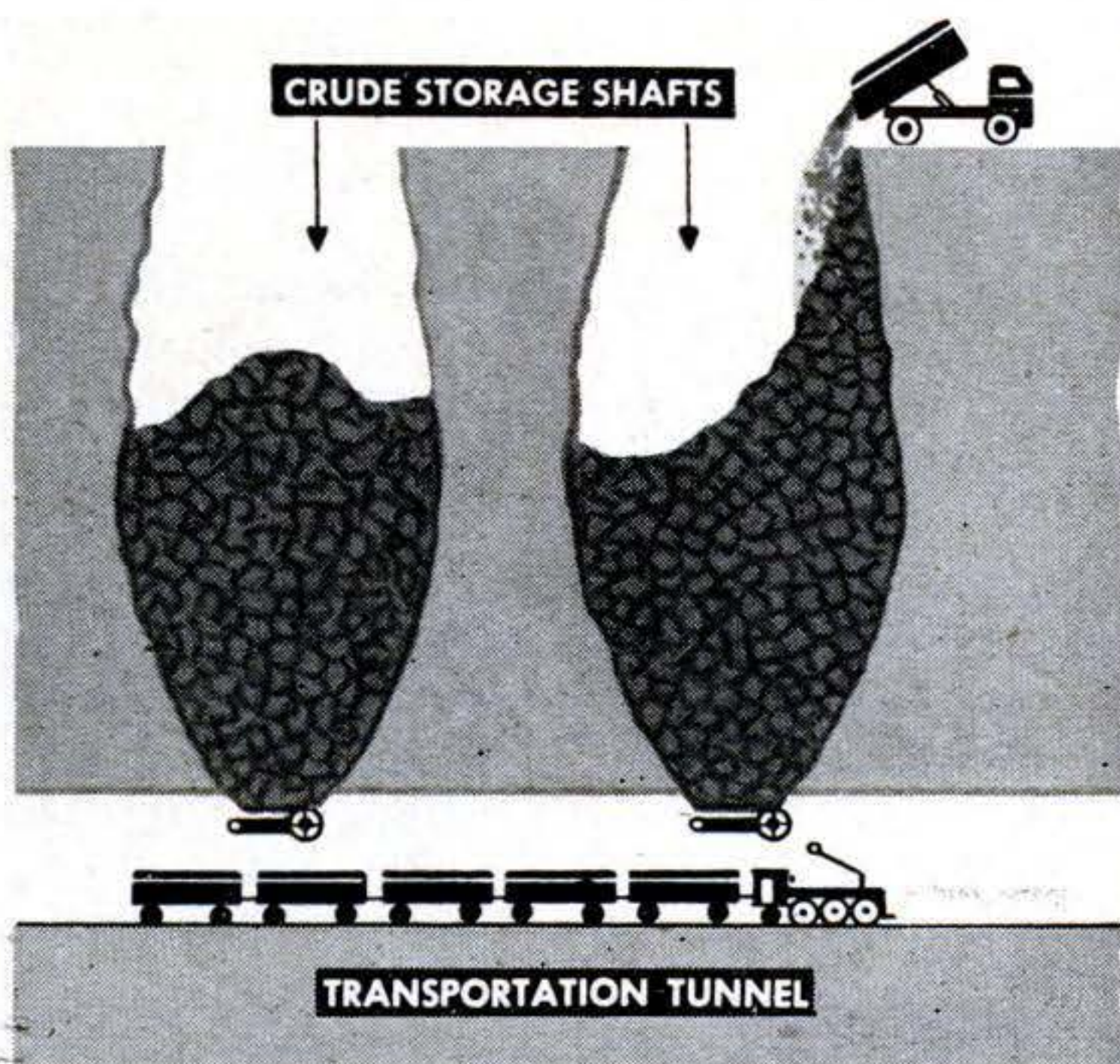
These wonder-working plants are called diatoms. They still grow abundantly in both salt and fresh water all over the world—wherever light and moisture are found with silica, a nonmetallic mineral from which they build their microscopic bones.

A kind of free-floating pond scum, but looking more like midget oysters than like any plant you'll find in your garden, the diatoms consist of two transparent shells folded over an oily cell. Scientists have classified and named more than 10,000 different shapes, from disks to needles. They multiply

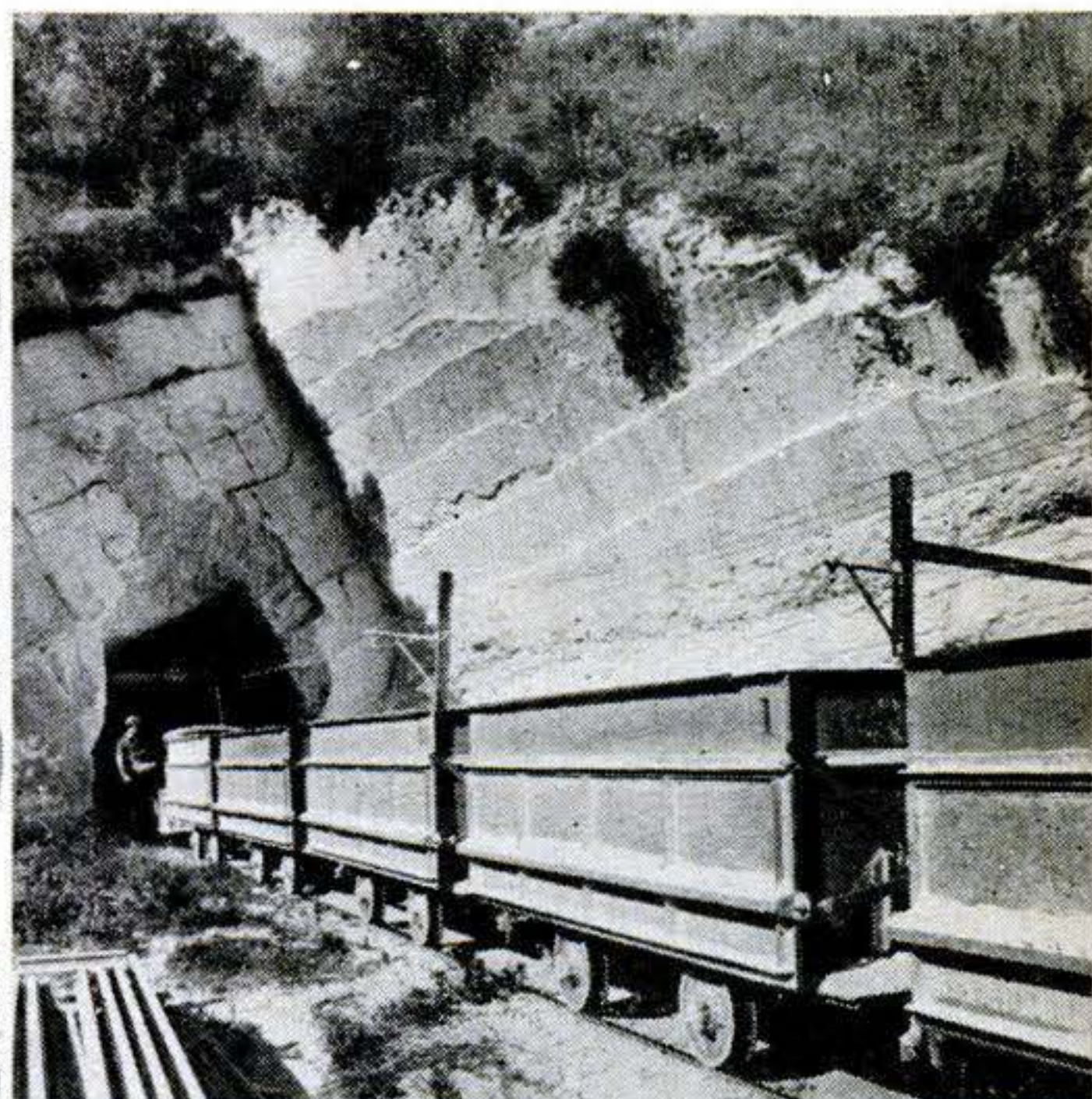


Five-yard bite of diatomite—fossilized diatom skeletons—is scooped from 4,000-acre deposit

near Lompoc, Calif., by power shovel. Johns-Manville company operates this open-pit mine.



Trucks dump crude material into huge storage bins carved from the deposit. The shafts load small train in tunnel at same level as mill.



Electric train carries diatomite to crushing mills. From those it goes to furnaces and blowers to be dried and classified for packing.

so fast by division of their single cell that one diatom could, theoretically, produce a billion descendants in a month. Only lack of enough food keeps them from overrunning the earth.

In the prehistoric Miocene Age, diatoms flourished profusely in the ocean and lakes along what is now the U. S. west coast—possibly because of unusually large amounts of silica in the water from volcanic eruptions. Their shells, sinking to the bottom as the plants died and rotted, accumulated at the rate of half an inch a year for 50 centuries. Later these fossilized skeletons were thrust

high and dry by some gigantic shift in the earth's crust. Today they form vast deposits of almost pure silica in the coastal hills.

From a single 4,000-acre deposit, 1,400 feet deep, the Johns-Manville company quarries 100,000 tons of chalky diatomaceous earth a year near Lompoc, Calif. Other large open-pit mines are worked by the Dicalite Co. near San Pedro and in Oregon. Smaller veins of diatomite, as it's called for short, have been tapped in Washington, Idaho, Florida, Vermont, Virginia, and Europe.

At Lompoc, electric shovels load five-yard mouthfuls of the fossilized diatoms

into trucks that dump them into "glory holes" hewed out of the underlying diatomite. Steel cars are filled from the lower ends of these storage shafts and drawn through a tunnel to a nearby mill.

There the crude diatomite is broken down into chunks smaller than your fist by a hammer mill. Riding a breath of hot air, the chunks then are blown through huge pipes until they become flourlike dust.

Under a microscope, this dust turns out to be not solid particles, but a mass of thin-walled holes so closely spaced that a pound of the material has a total surface area of 20,000 to 100,000 square feet. It's 65 to 95 percent air, weighs only 7 to 13 pounds per cubic foot, and will absorb 200 to 300 percent of its weight in water or oil.

Three main grades of refined diatomite are used by industry—natural, calcined, and white.

Naturals are processed simply by drying, milling gently to separate the individual diatoms without breaking their shells, and sorting them by air blasts into desired sizes. These are widely used as filtering agents. Mixed with cloudy liquid as it is pumped through a filter press, the diatom skeletons collect on cloth or wire screens along with suspended solids. The filter cake thus built up is kept porous because the particles separate the bits of solid and prevent them from forming a gummy layer that would block the flow. Products now filtered through diatomite run the alphabetical scale from acids and beer through lubricating and cutting oils to sugar, vitamins, and wax.

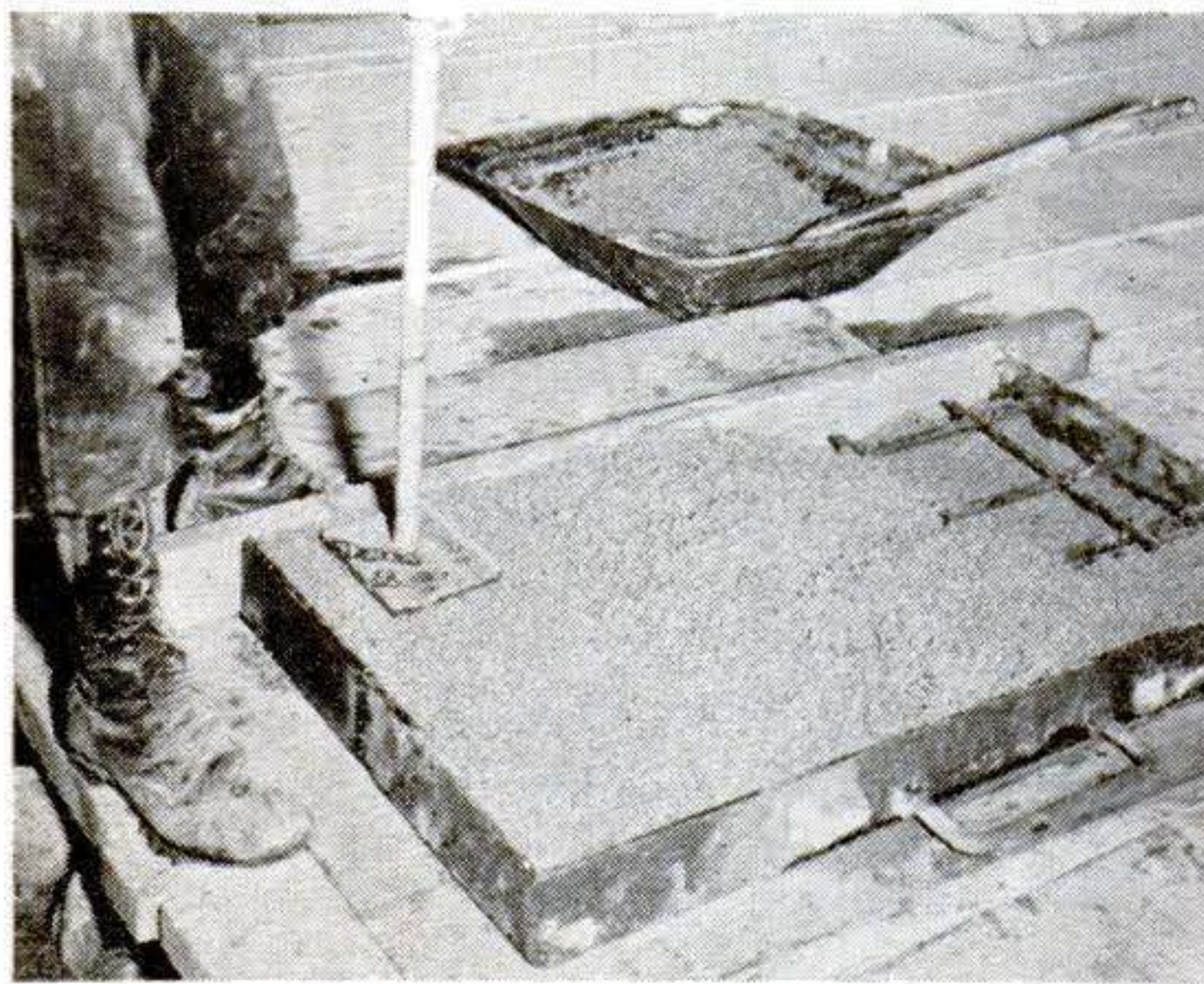
Calcined grades of diatomite undergo the

same preliminary treatment as the naturals and then are baked at temperatures up to 2,900° F. This makes them practically insoluble even in strong acids and unaffected by extreme heat. Thousands of tons a year go into insulating material. They also serve as filtering agents for corrosive acids and as catalyst carriers in petroleum refining.

White grades of Celite® and Dicalite®, the trade names under which refined diatomite is sold by Johns-Manville and the Dicalite Co., are processed by calcinating in the presence of added fluxes. As inert, non-coloring mineral fillers, they add bulk to paper, without materially increasing its weight, and serve as a flattening agent in paint. Diatomite fillers also go into rubber, ceramics, plastics, asphalt, linoleum, and abrasive metal polishes and kitchen cleansers. In papermaking they not only improve the product, but keep the machinery free of pitch that would clog pipes and rollers.

Though new uses for diatoms are constantly being found, these minute plants are not new to science or industry. The Romans used diatomite in the construction of buildings, without knowing what it was. In 1702, in Holland, Anthony Van Leeuwenhoek first saw one while peering at a specimen of "clear" water through one of the 247 microscopes he built.

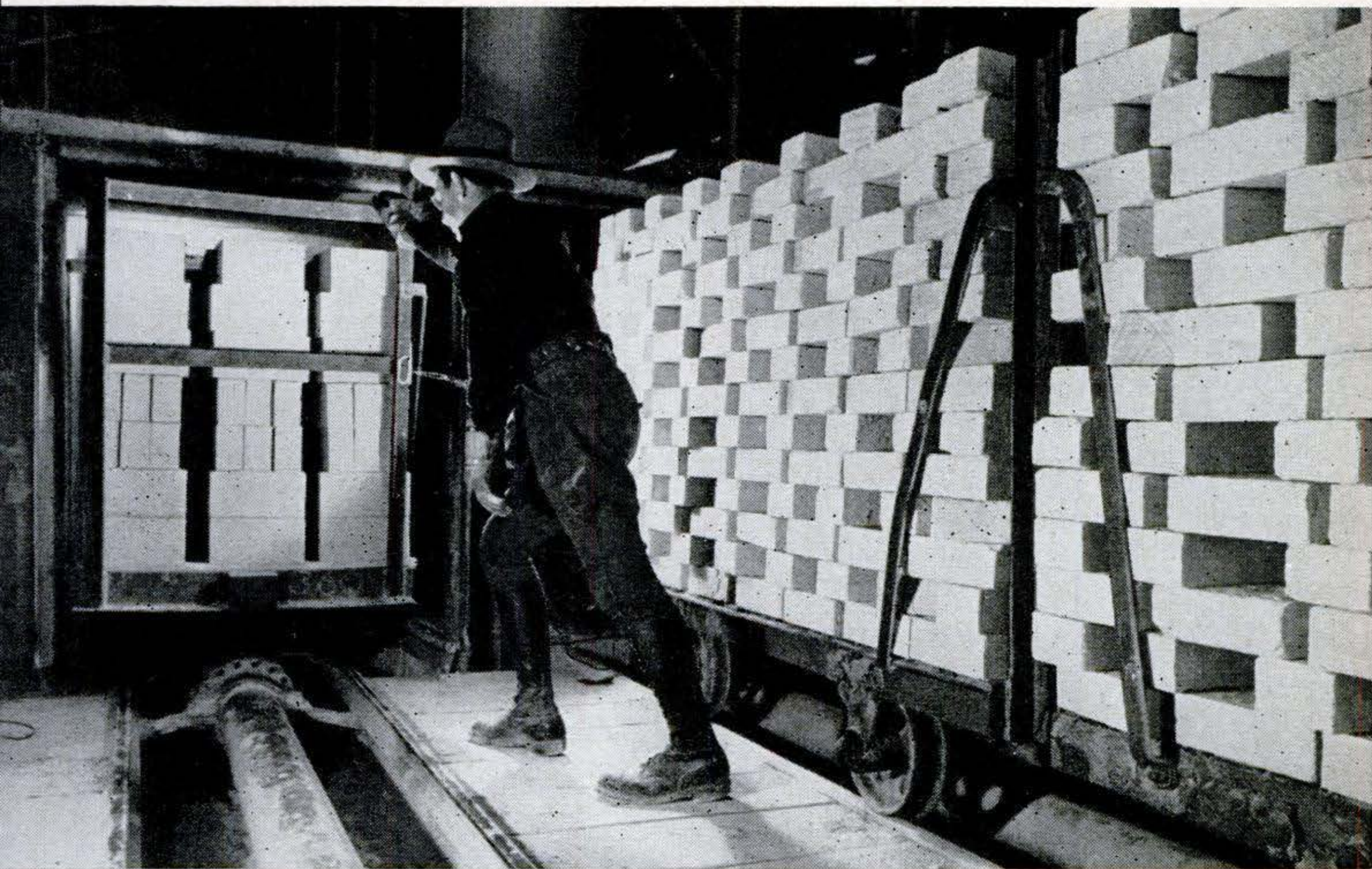
In modern industry, the diatom's career dates from 1866, when the Swedish chemist, Alfred Nobel, saturated diatomite with nitroglycerin to give the world its first stick of dynamite. Even distribution of the explosive through the fine filler made it safe to handle by insuring smooth, complete de-



As insulating material, calcined diatomite resists heat 10 to 12 times better than fire brick. Mixed wet with concrete and tamped into a form, as shown above, it makes a lightweight



furnace door that will withstand direct temperatures as high as 1,800° F. It can also be used in powder form between brick walls, or as plaster over furnaces, boilers, and pipes.



Insulating brick made of diatomite move into kiln for hardening and burning to increase their strength and resistance to heat. Porous struc-

ture of the material—millions of microscopic air cells per square inch—also makes it useful in floors and walls of buildings to deaden sound.

tonation. Today diatomite does much the same job every time you light a match.

In World War II, diatoms served on both sides. The Nazis used *kieselguhr*, their name for diatomite, in synthetic production of gasoline. American infantrymen drank clean water from polluted streams by running it through diatomite in portable filters. The

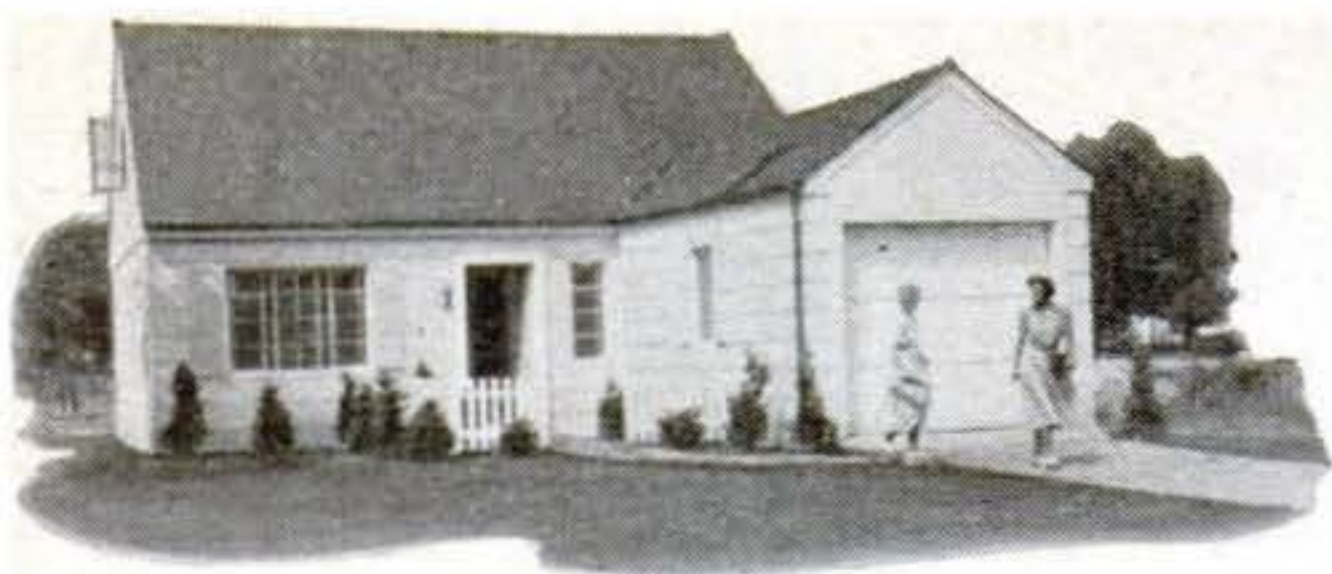
Navy used it to strain finely emulsified oil globules from steam-engine condensate for return to ships' boilers. A large tonnage went into lusterless paint for camouflage.

Now, like the men they fought beside in every theater of combat, the diatoms are finding more jobs than ever before in peacetime industry. END



Pellets shaped from powdered or granular diatomite serve as catalyst carriers in the refining of petroleum and production of acids. Though highly absorbent, the material—pure silica—is

chemically inert. These properties and its light weight make it also a good carrier of liquid or gaseous insecticides and a useful fluffing agent for lightening and extending heavy dust poisons.



Whole House Cast Like Toy

FULL-SIZE homes are being turned out of molds like toy soldiers in an experimental building project at Port Washington, Long Island. The houses are made almost completely in a single operation by pouring concrete into special forms that shape the entire unit—exterior and interior walls, rooms, hallways, doors, windows, and even

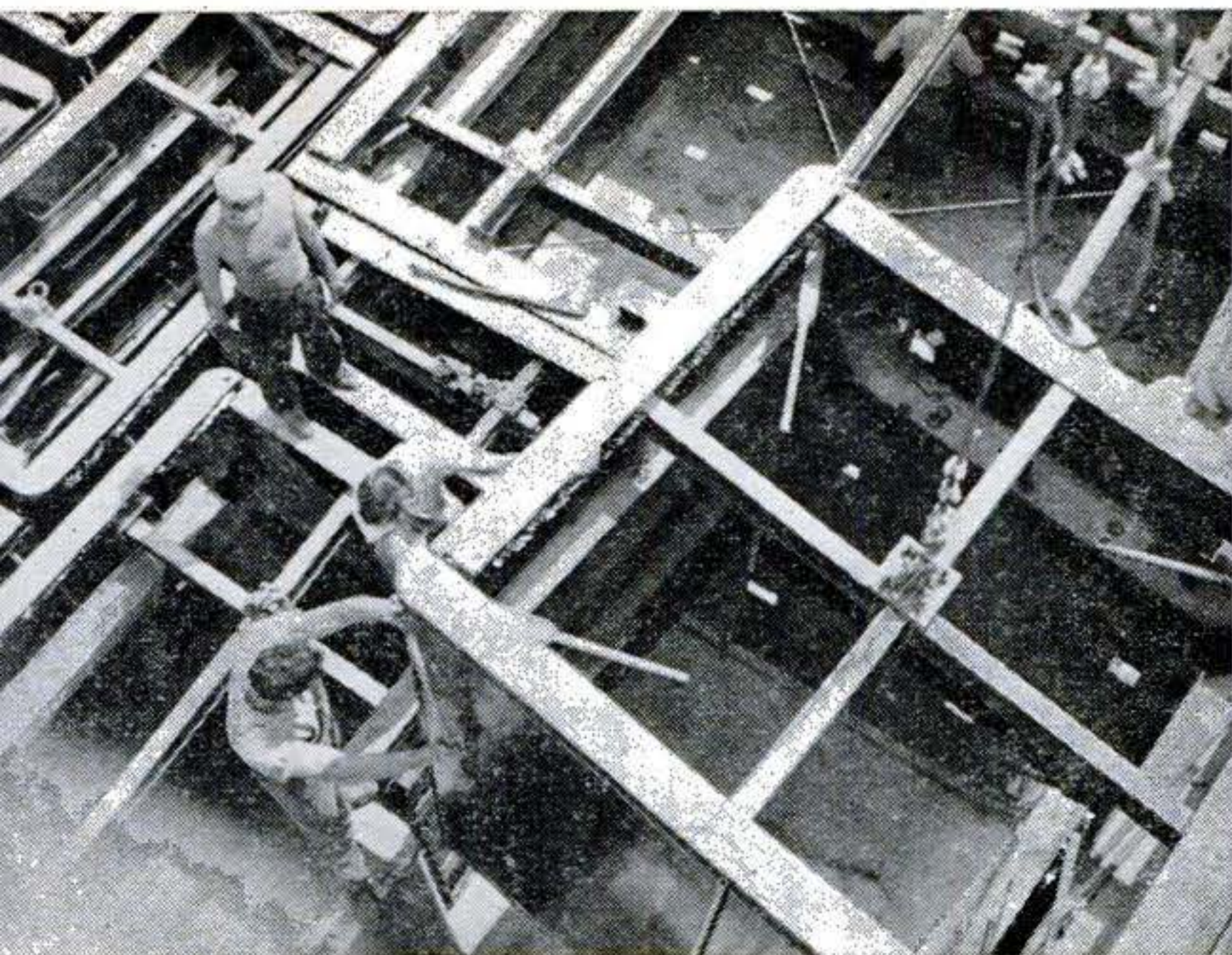
moldings. No lumber is used below the attic beams and roof rafters.

The mold-casting method, developed by Patrick J. Callan, of Callan Builders, Inc., turns out a completed two-bedroom home in about six days. The cost is claimed to be 30 percent below that of comparable houses built by customary methods.

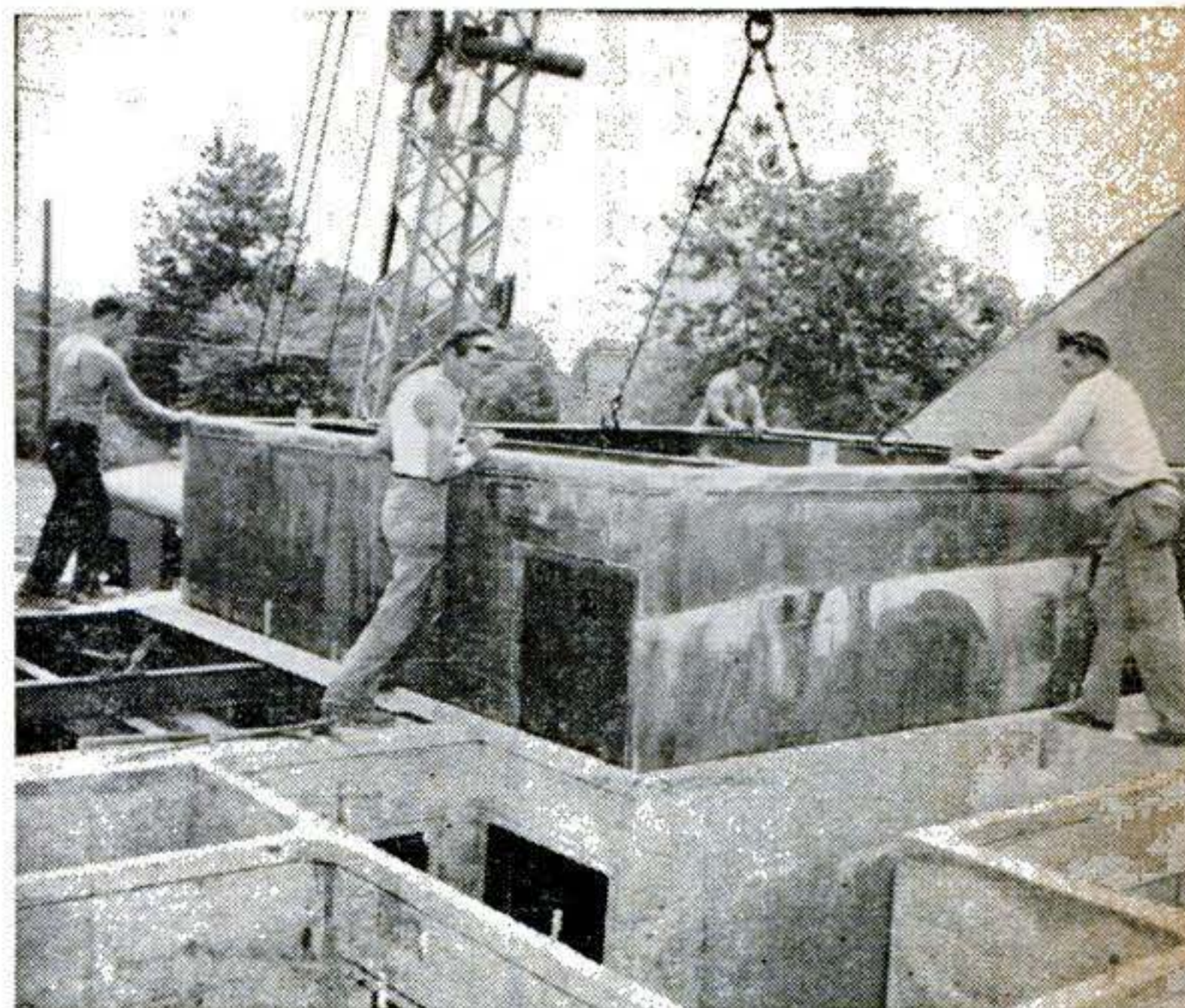


Cores that make individual rooms are carefully placed with crane. Multi-layer floor, containing pipes for radiant heating system, has already been poured. Special frames to form

window and door openings are bolted to the cores—notice window form at left center. Huge matrices are bolted around the group of inside cores to form the outside walls of the house.



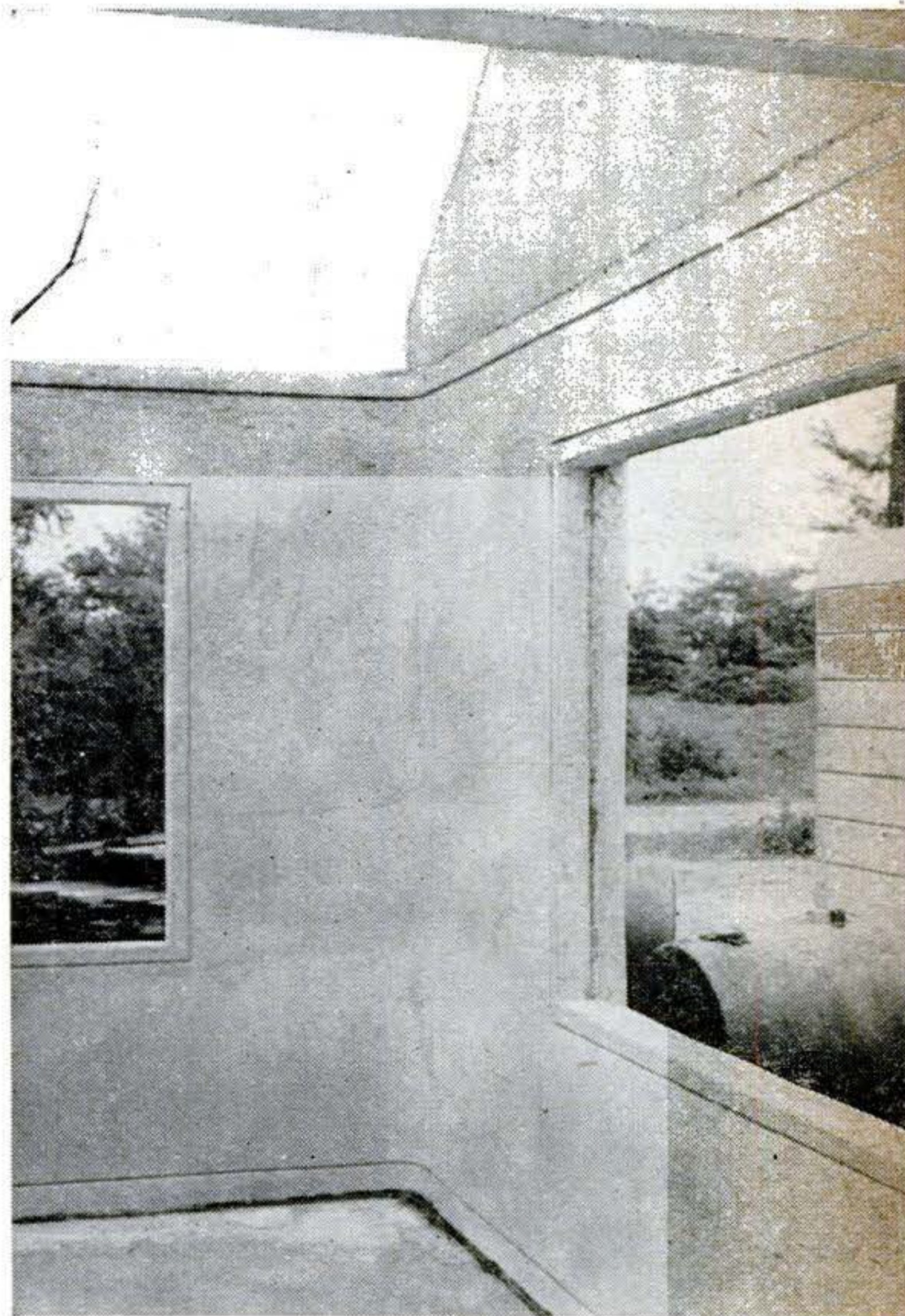
Core for one of interior sections is set down into the blueprintlike pattern made by the forms. The cores are made of heavy steel, polished smooth and clean, then sprayed with oil to prevent the concrete from sticking. Notice the bracing to insure against bulges in walls.



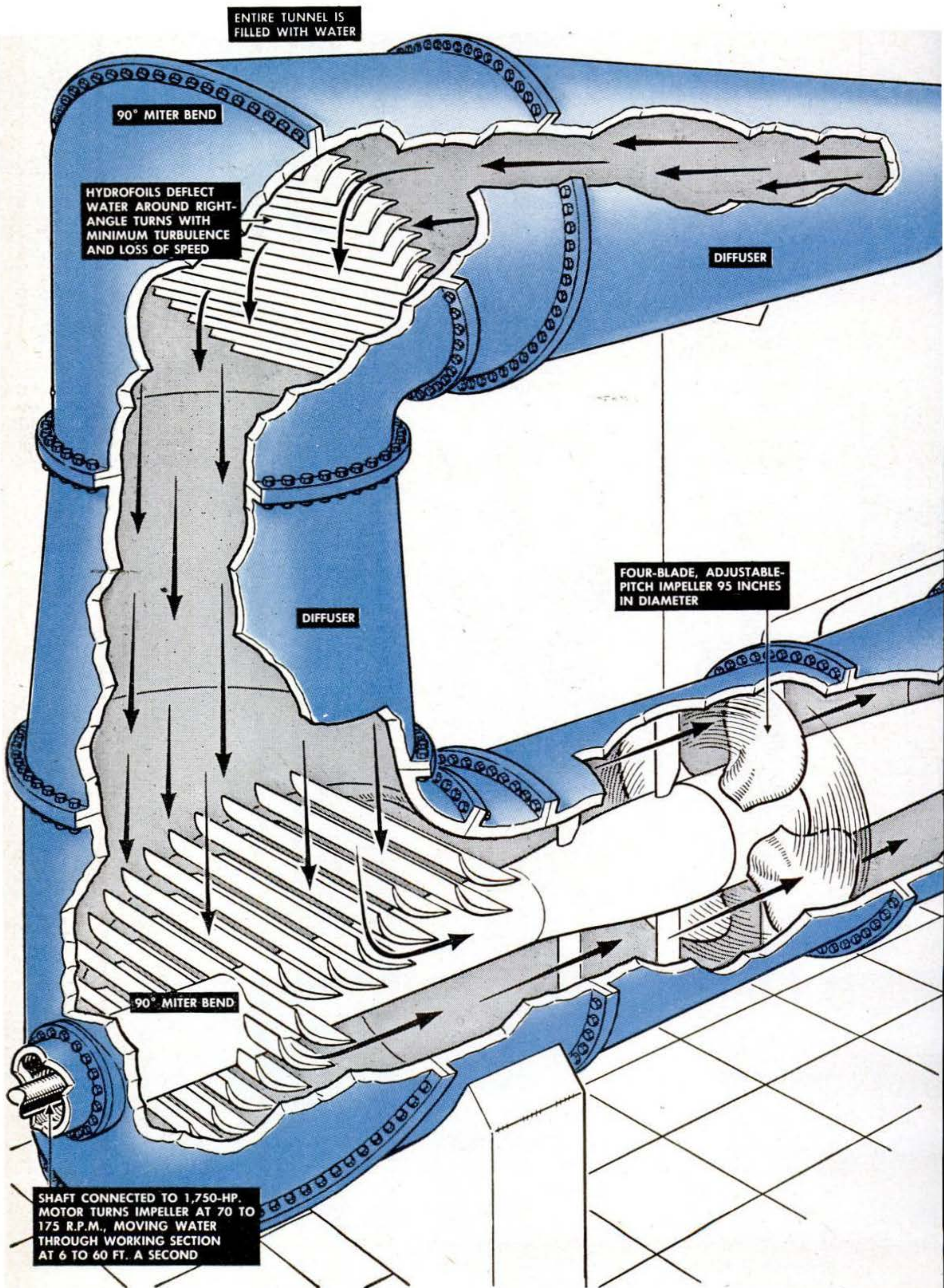
Five-ton core for living room is lifted out after the whole house has been poured in one operation. The walls made in this way consist of two layers of monolithic concrete reinforced with steel road mesh and separated by special insulation to resist moisture from condensation.



Workman removes the steel form that makes bathroom-window opening. Even the spaces for switch boxes and door hardware are cast with the house. Notice beveling on the exterior wall, designed to make the house look like a farm cottage surfaced with heavy clapboard.



Interior walls have rounded corners and beveling to look like moldings. After casting, walls are scoured with steel wool to give a finish smoother than plaster. Paint or wallpaper is applied directly on concrete. Forms, designed in four-inch modular units, permit layout variety.



ENTIRE TUNNEL IS
FILLED WITH WATER

90° MITER BEND

HYDROFOILS DEFLECT
WATER AROUND RIGHT-
ANGLE TURNS WITH
MINIMUM TURBULENCE
AND LOSS OF SPEED

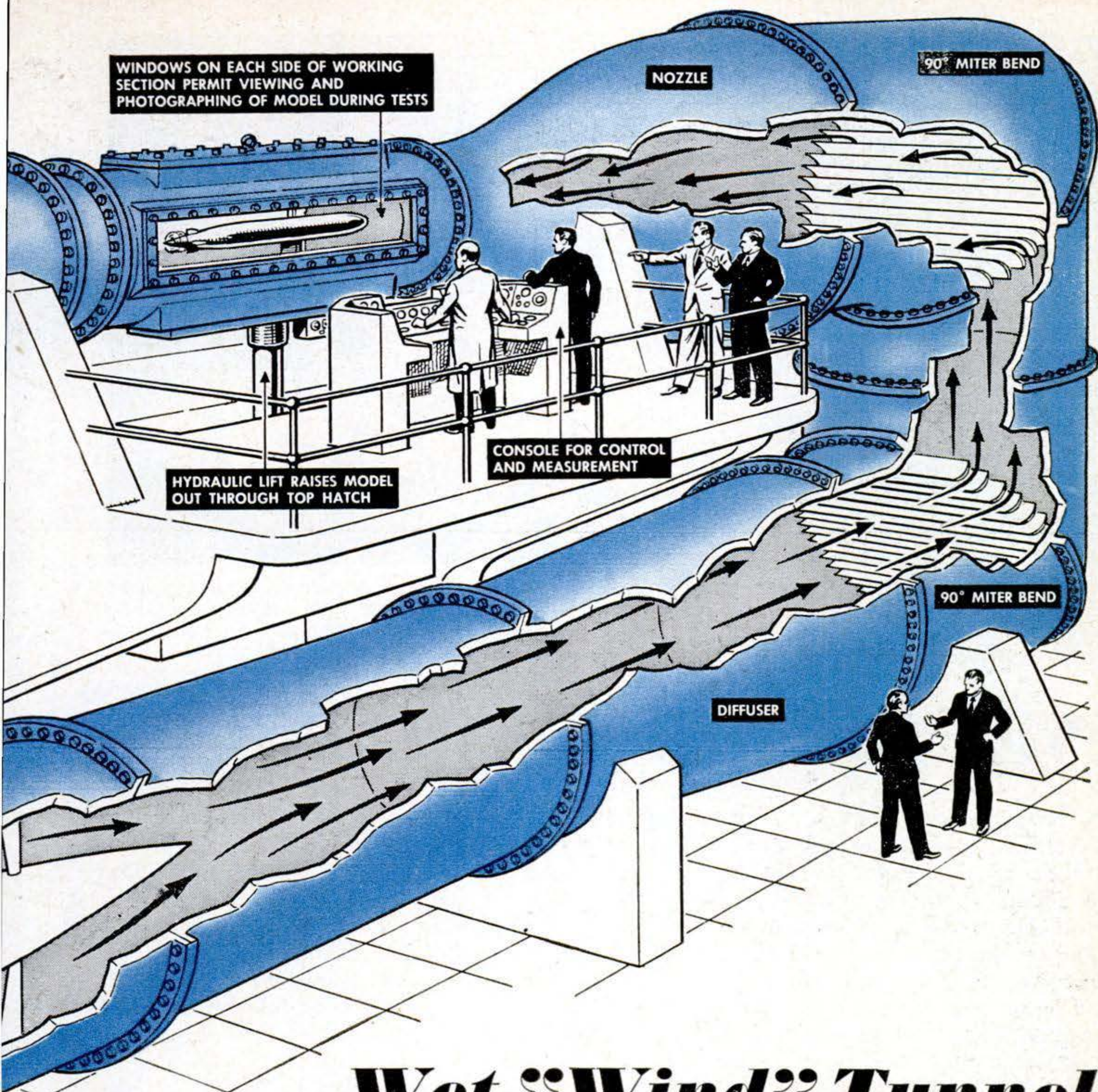
DIFFUSER

DIFFUSER

FOUR-BLADE, ADJUSTABLE-
PITCH IMPELLER 95 INCHES
IN DIAMETER

90° MITER BEND

SHAFT CONNECTED TO 1,750-HP.
MOTOR TURNS IMPELLER AT 70 TO
175 R.P.M., MOVING WATER
THROUGH WORKING SECTION
AT 6 TO 60 FT. A SECOND



Wet "Wind" Tunnel Tests Torpedoes

YOU'VE heard lots about how wind tunnels are used to test models of new airplanes. Now comes the water tunnel to do the same thing with underwater missiles.

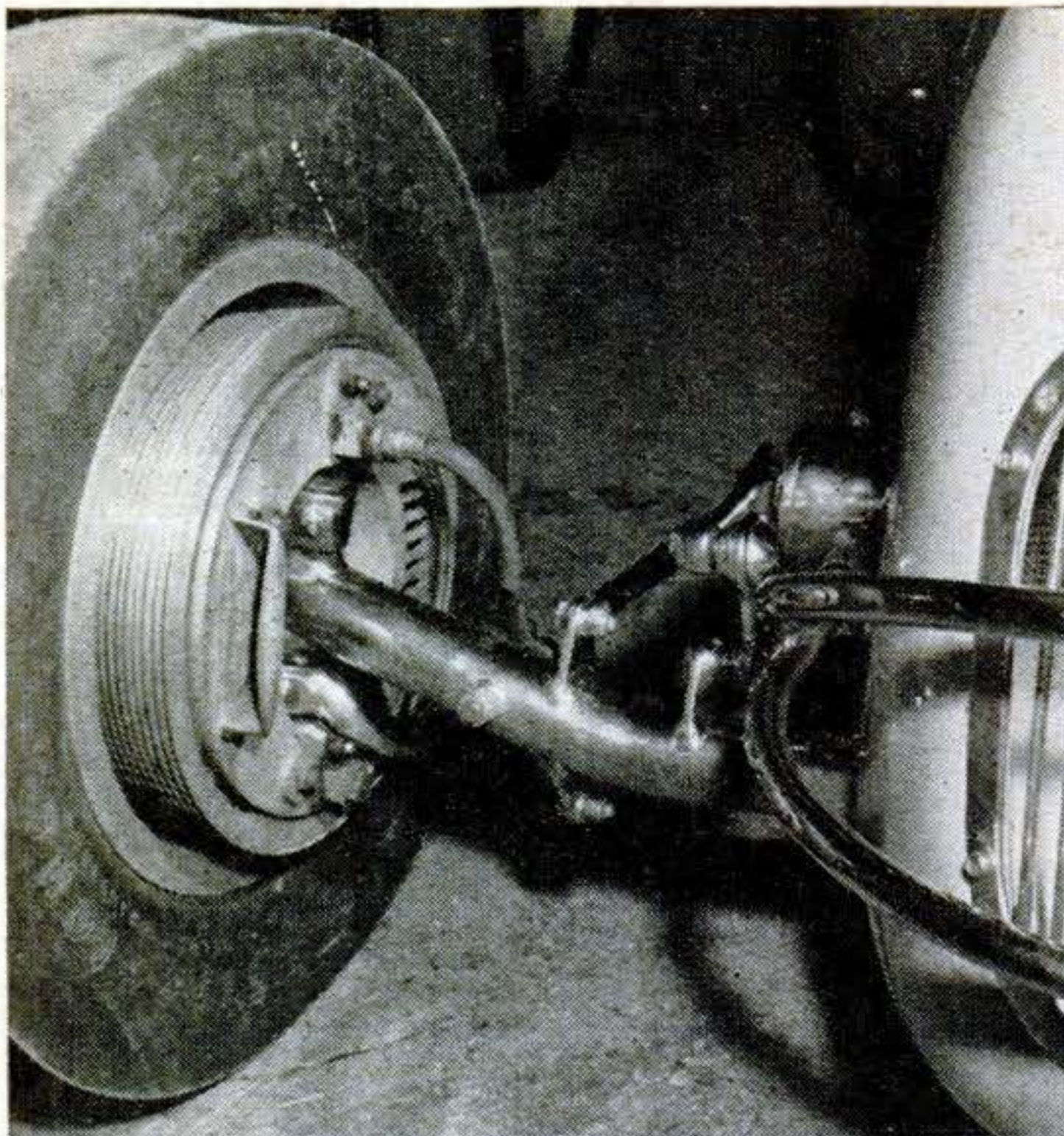
The 600-ton water tunnel shown in this cutaway drawing will be the biggest ever built—97 ft. 7 in. long, 31 ft. 1 in. high. It will be completed next year at State College, Pa., by Pennsylvania State College and the U. S. Navy's Bureau of Ordnance.

In its working section, 4 ft. in diameter and 14 ft. long, engineers will be able to watch, photograph, and measure the per-

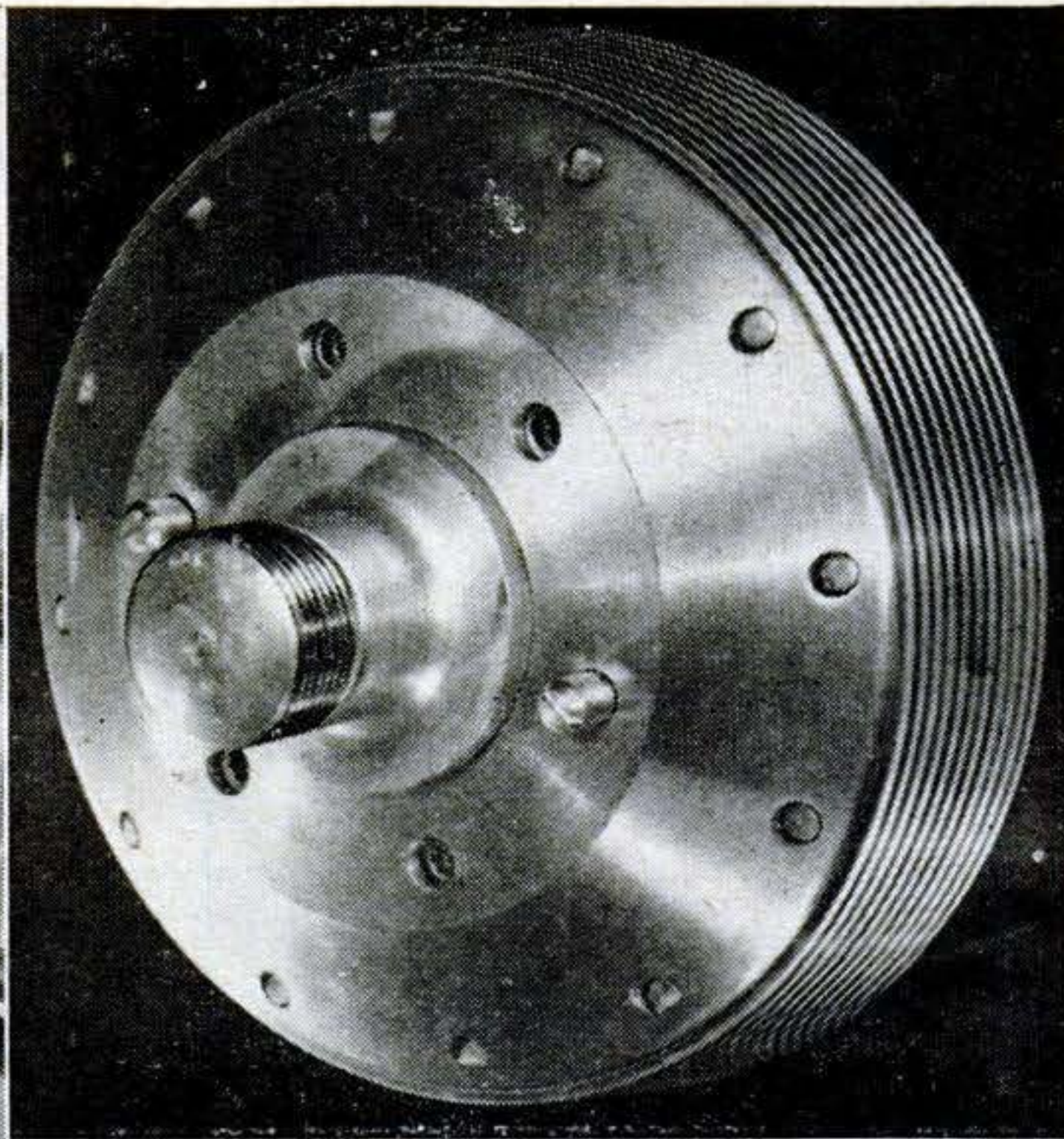
formance of test models as if they were traveling under water at speeds up to 41 m.p.h. At full blast, 100,000 gallons of water in the tunnel will make a complete circuit of the huge tube every 18 seconds.

With the tunnel's electric pump turned off, the models—up to 8 ft. long and 8 in. in diameter—also can spin their own motor-driven propellers in static water at pressures of 3 to 60 lb. per sq. in. and temperatures up to 120° F. Other controls will keep the water clear and regulate the amount of gas dissolved in it.

END



Installed on midget racer, finned brake drum extends into air stream for greater cooling effect. Customary air scoop in front and exit vents in back keep hydraulic brake shoes cool.



New brake drum, using aluminum alloy chemically bonded to cast iron, employs iron only as liner to grip brake shoe. Liner is much thinner than usual. Eleven fins help dissipate heat.

New Brake Sheds Heat

NINE chances out of ten, the runaway car, truck, or bus is the victim of overheated brakes. That's because brakes begin to lose their grip when they get hot. Now metallurgists have found a way to keep brakes from overheating. By bonding aluminum to cast iron in a chemical process developed during the war for use in air-cooled aircraft engines, they have produced a brake that gets just so warm and no warmer.

The trick in the new brake is in the aluminum. This metal has an extraordinarily high heat conductivity—it spews heat away from itself more than twice as fast as iron.

To speed up this dissipation of heat even more, the designers of the new brake, the Al-Fin division of the Fairchild Engine & Airplane Corp., have borrowed another page from the design of air-cooled aircraft engines. They have encircled the brake drum with fins. Increasing the surface over which heat is lost, these help dissipate the excess heat from friction in the brake drum in the same way that the fins belting the cylinders of aircraft engines help carry off the excess heat of combustion.

On the race track, where a midget racer was used as a guinea pig for the aluminum-iron brake drums, the ordinary brake builds

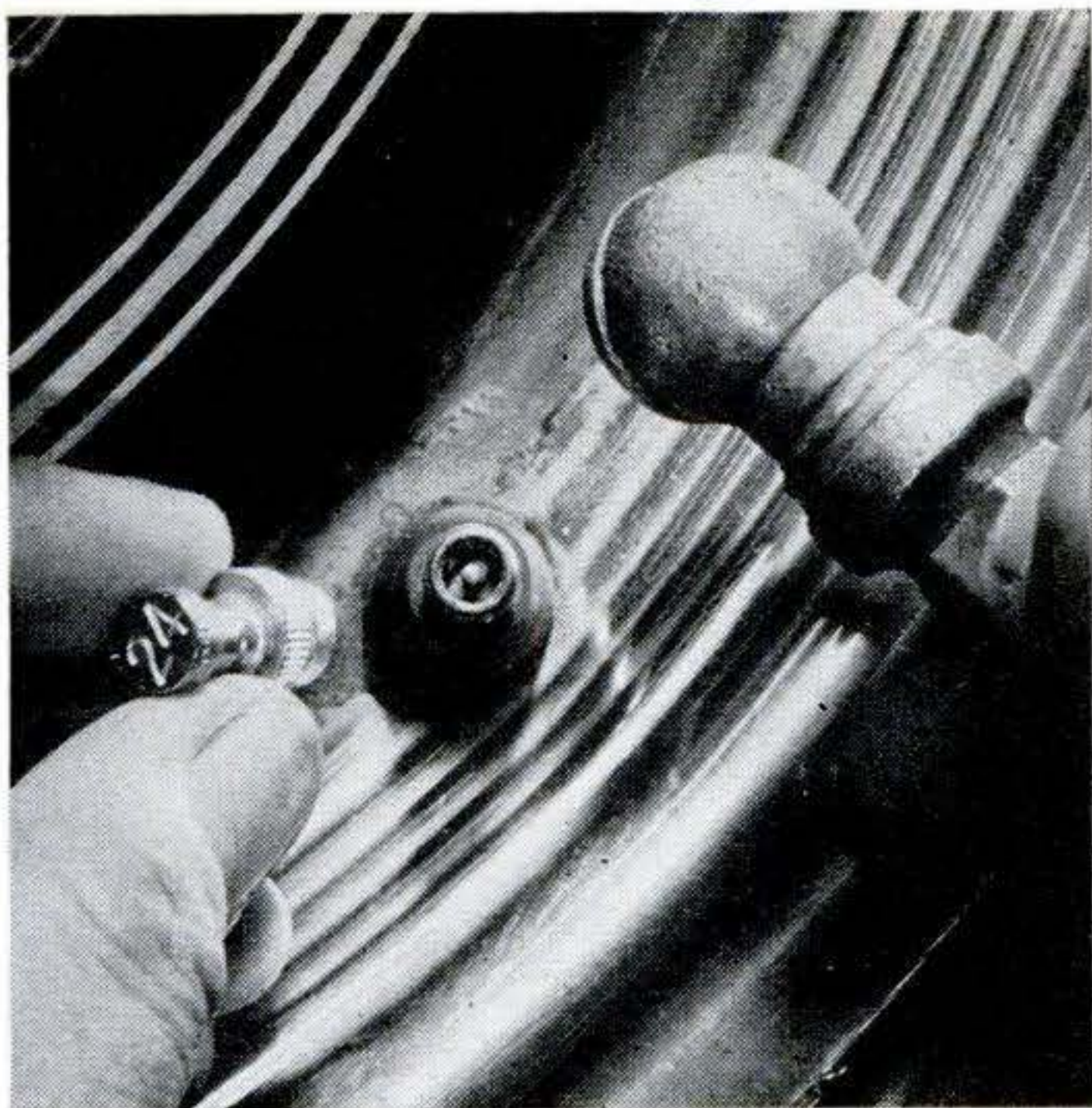
up heat rapidly. After a few laps, the brakes, jammed on every time the driver hits a turn, heat to about 750° F.—and they don't lose that heat. The drums act as a reservoir or trap for the heat. The brakes of some racers have even become incandescent.

This, incidentally, slows down a race. A driver gets worried about his ability to cut his speed on the turns, and his accelerator foot gets light.

The Al-Fin® brakes on the test racer were used in as many as 15 consecutive races without showing wear or needing adjustments. Ordinary iron brakes must be re-lined after a single 100-lap event. Even after eight or 10 hard laps, they begin to “fade”—lose their braking power. Adjustments must be made after every race, and the brakes frequently show signs of scoring and discoloration.

The new brake is afflicted with none of these ills. It heats to around 500° F.—and stays there. That's within the permissive heat limit. The significance of this performance is even greater for commercial vehicles than for racing cars. For bus and truck operators, too, must combat “fading”: on a long down-grade, brakes that begin losing their grip are no joke.

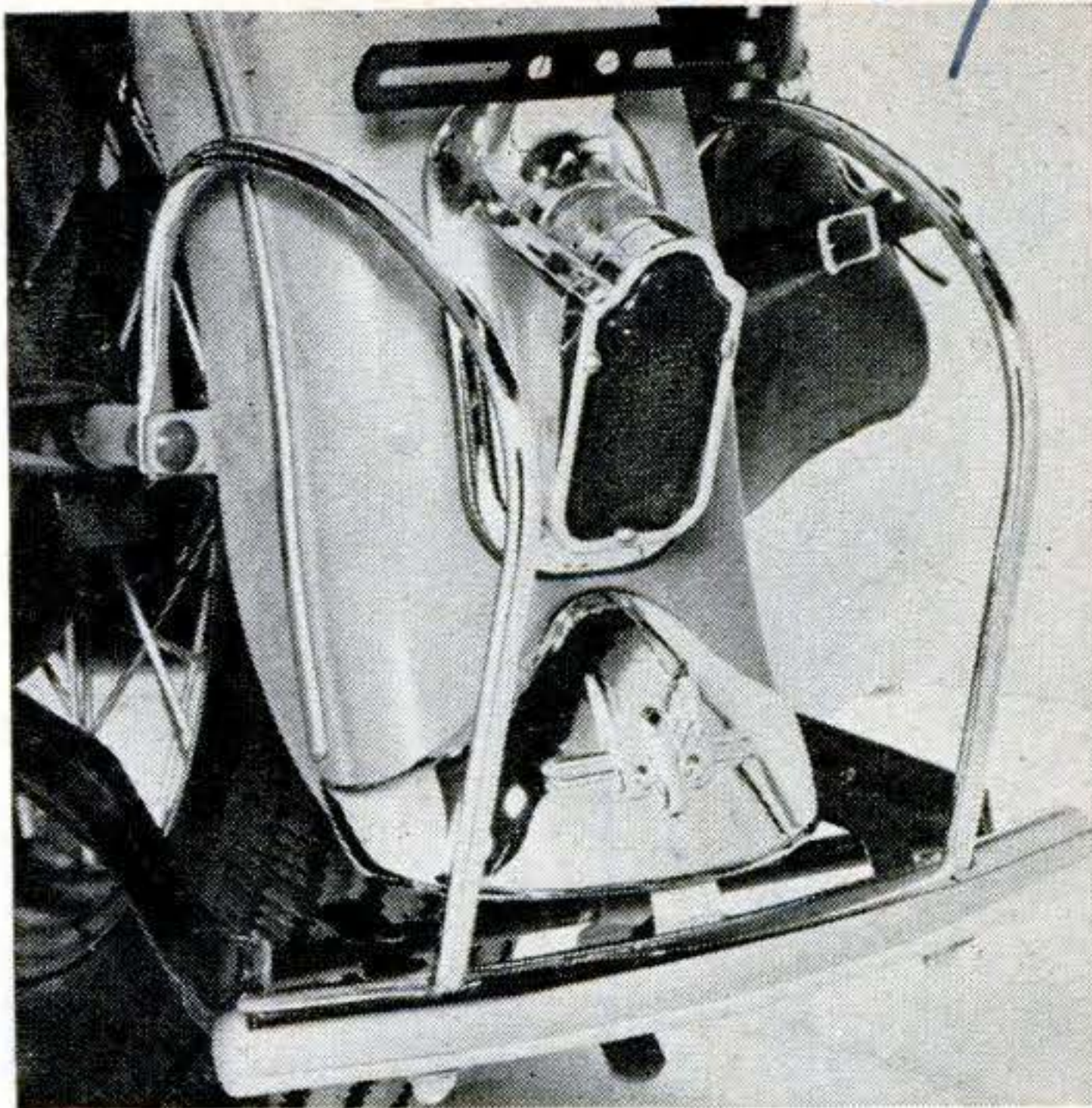
6183



Valve Cap Shows the Pressure

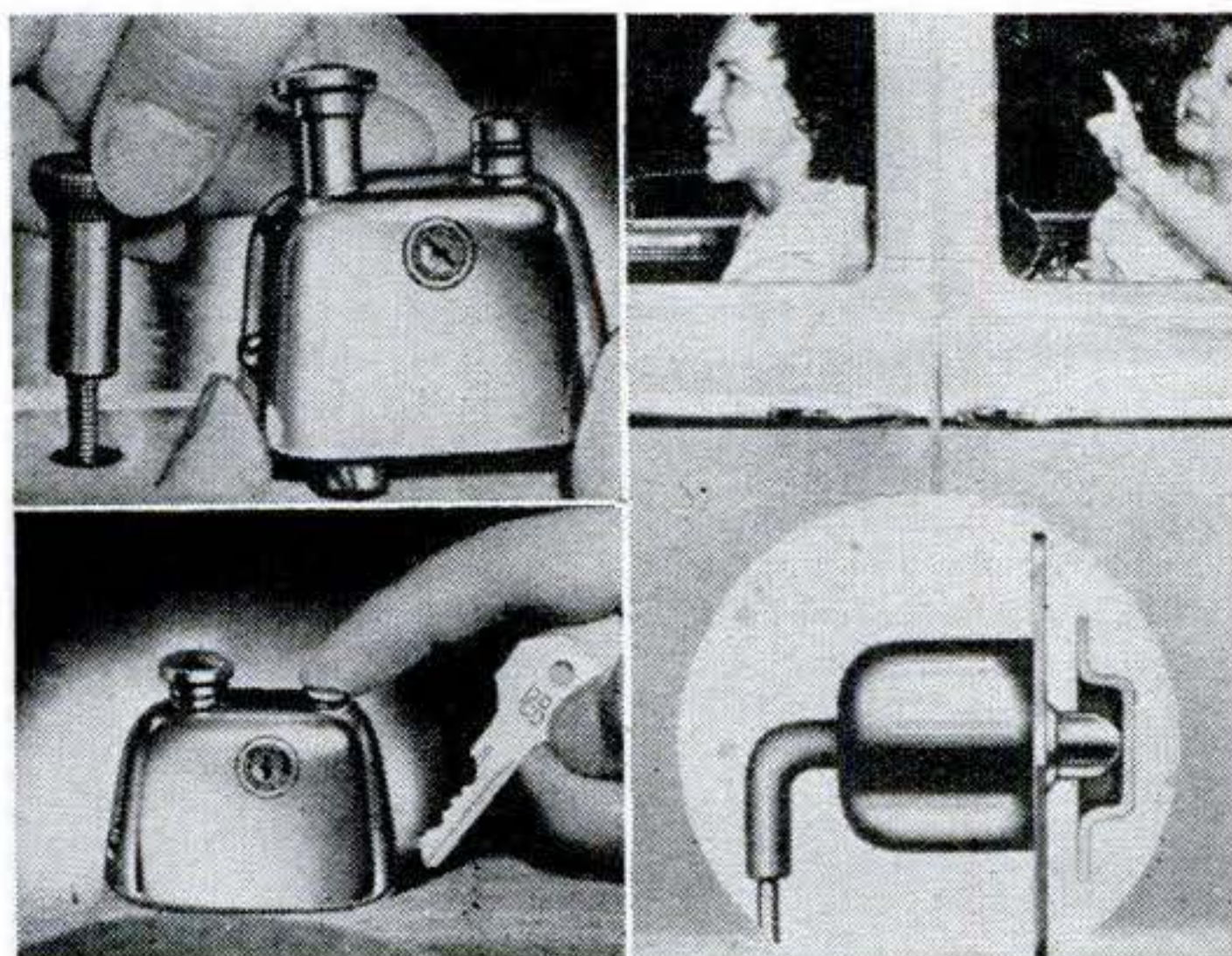
THESE valve caps tell service-station attendants exactly what air pressure you want. Especially good for low-pressure tires, the caps retail at a dime apiece. A. Schrader's Son, Brooklyn, N. Y., makes them with various pressure figures.

6077



Bumper Protects Motorcycle

COMBINING utility with good appearance, this new style Harley-Davidson rear bumper lines up with the rear stand of the motorcycle. Thus any impact from the rear is absorbed in part by the stand. The chrome bumper is available as an accessory.



New Locks Safeguard Children

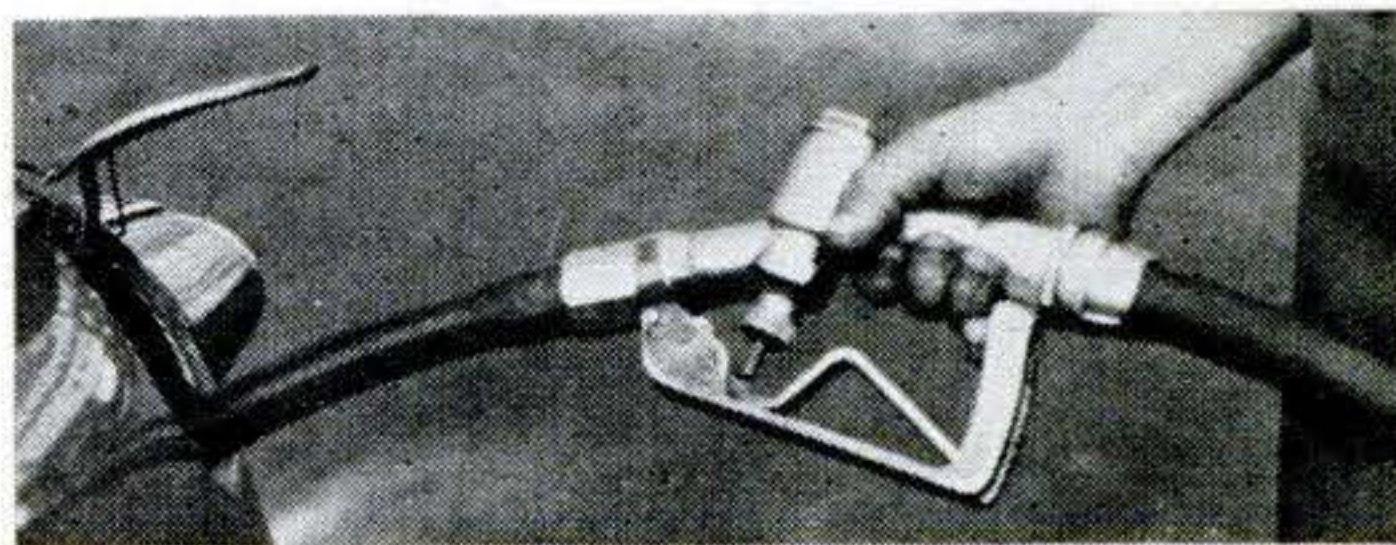
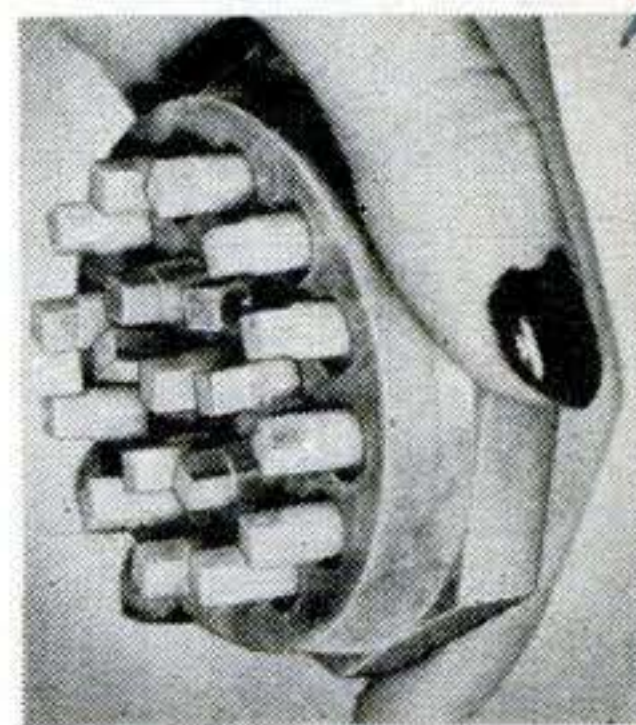
KEEPING little ones from falling out a rear door has always concerned parents. Here are two locks to prevent this.

At left are two views of one made by Semco Research, Inc., Inglewood, Calif. The door-lock button now on your car is removed and the lock installed in its place. When the safety-button is depressed, the door must be opened with the ignition key.

Inset at right is a lock made by Accurate Tool and Engineering Co., San Diego, Calif. The lock is vacuum operated. The door can't be opened while the engine is running unless the driver presses a button.

Removes Ice from Windshield

HERE'S a new device that's said to remove ice from windshields quickly and thoroughly. Made of plastic, it consists of a number of teeth set loosely in a base that fits the palm. Since the plastic is softer than glass, the windshield can't be scratched. Harshbarger Products Co., Detroit, makes it.



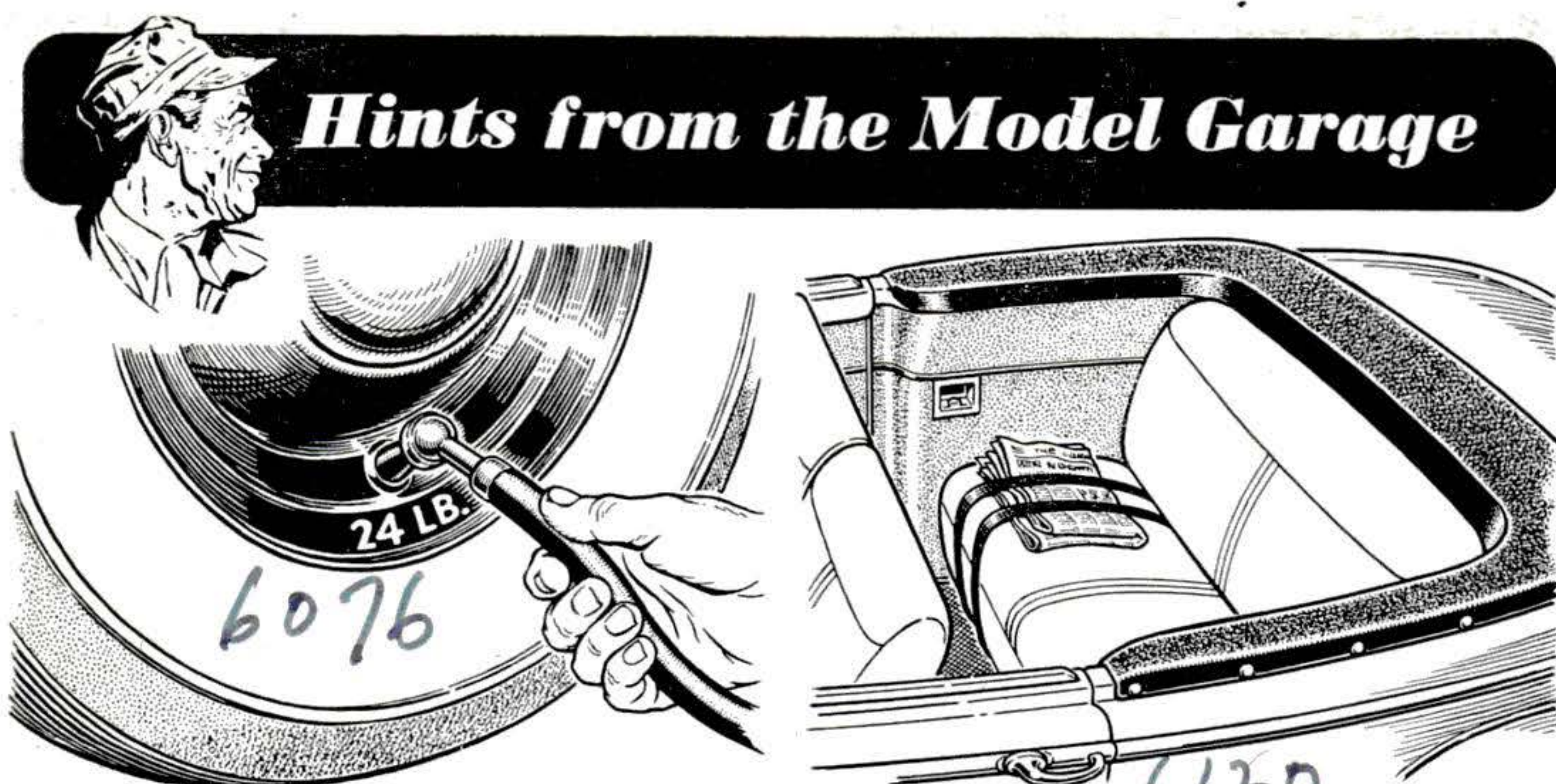
Gas Nozzle Made of Rubber

YOU'LL probably be seeing rubber nozzles like this one at gas stations before long. Just announced by The B. F. Goodrich Company, it eliminates any chance of damage to the car finish or inlet pipe. It also safeguards against danger from static electricity.

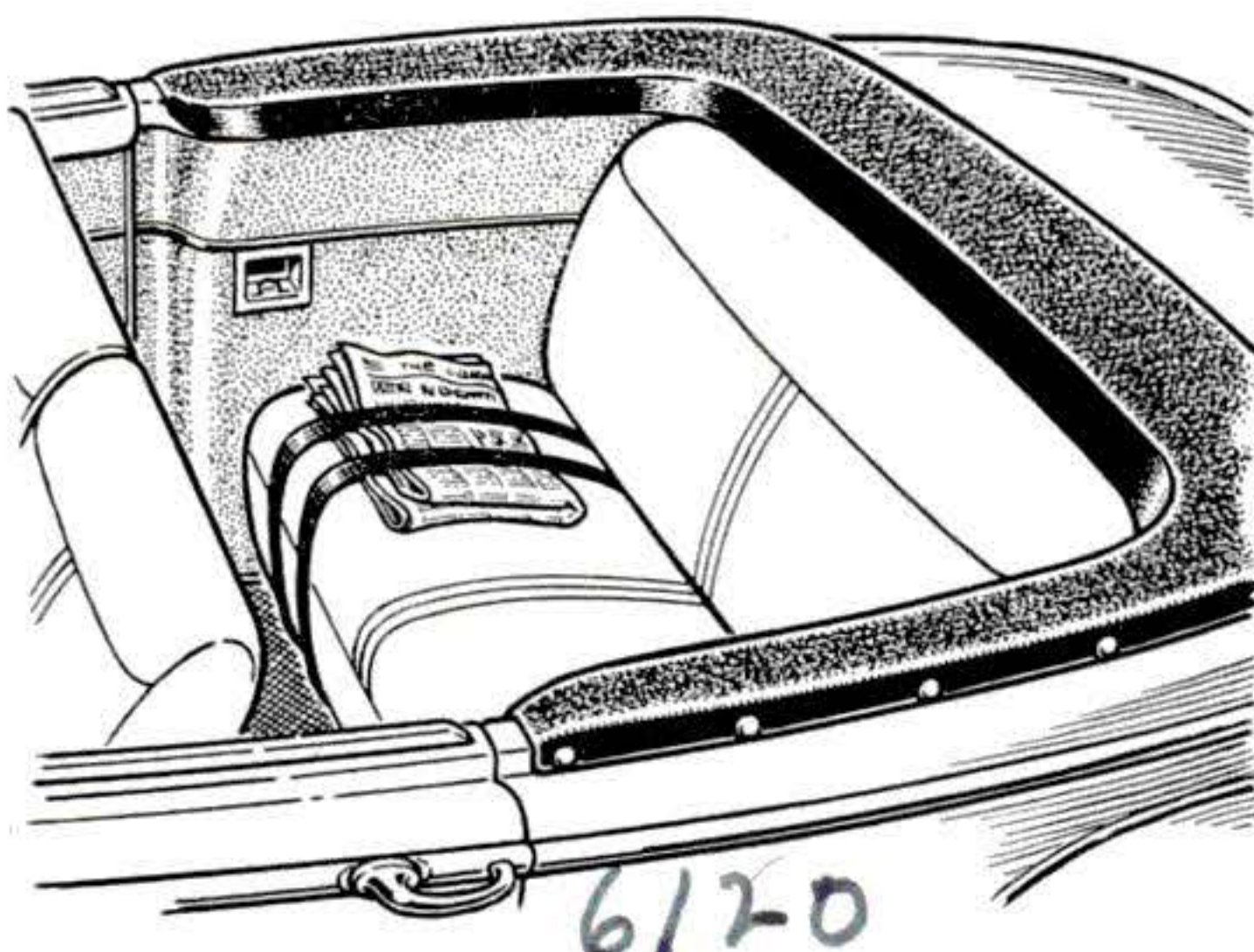
6130
6179

6153

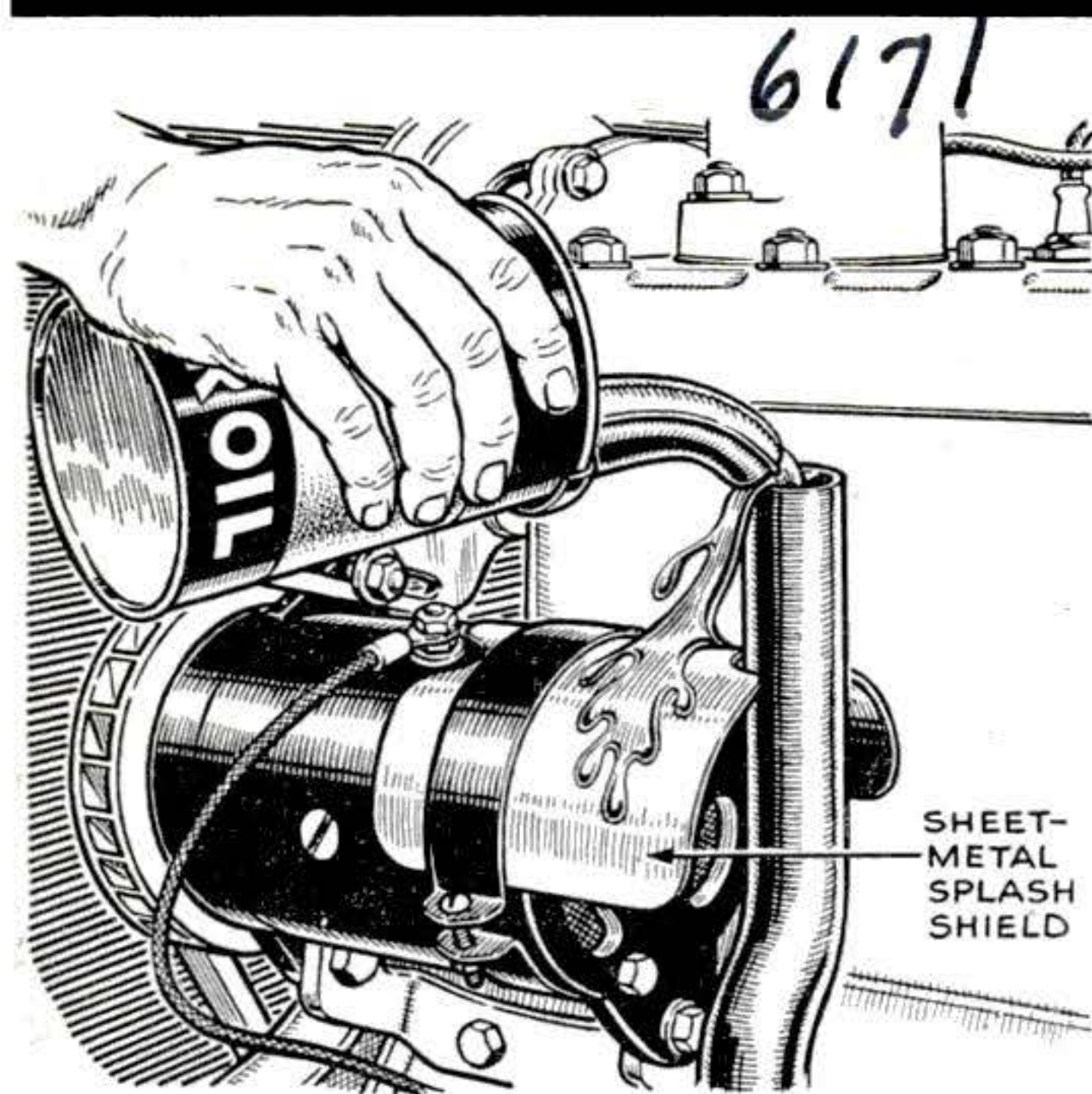
NOVEMBER 1948 169



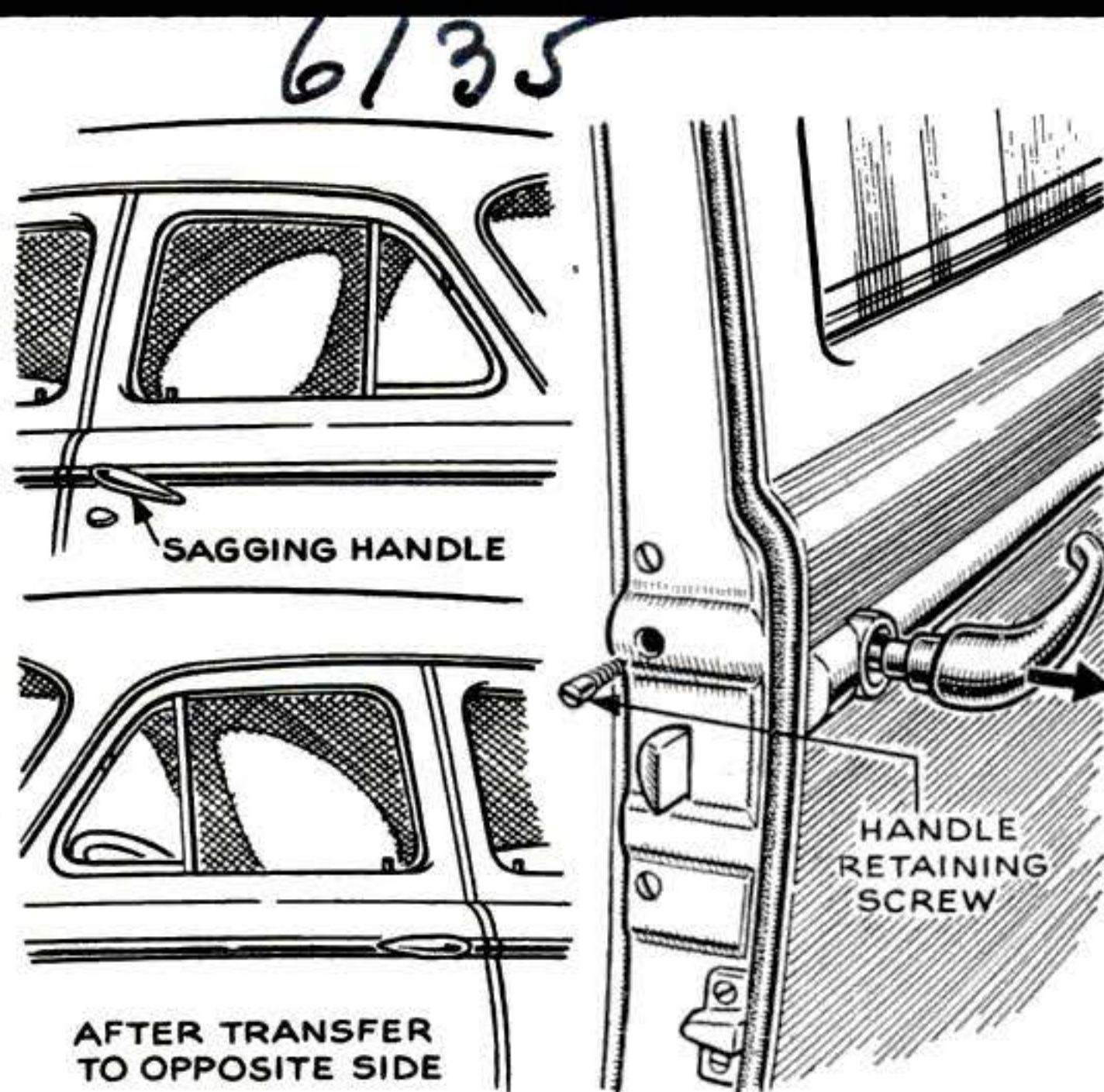
Prevent Overinflation. The new low-pressure tires are sometimes overinflated through carelessness. As a reminder to service-station attendants, paint the correct pressure on the rim beside each valve stem with white enamel, or apply waterproof adhesive tape with the figure inked on. You can also buy markers for your caps. See page 169.



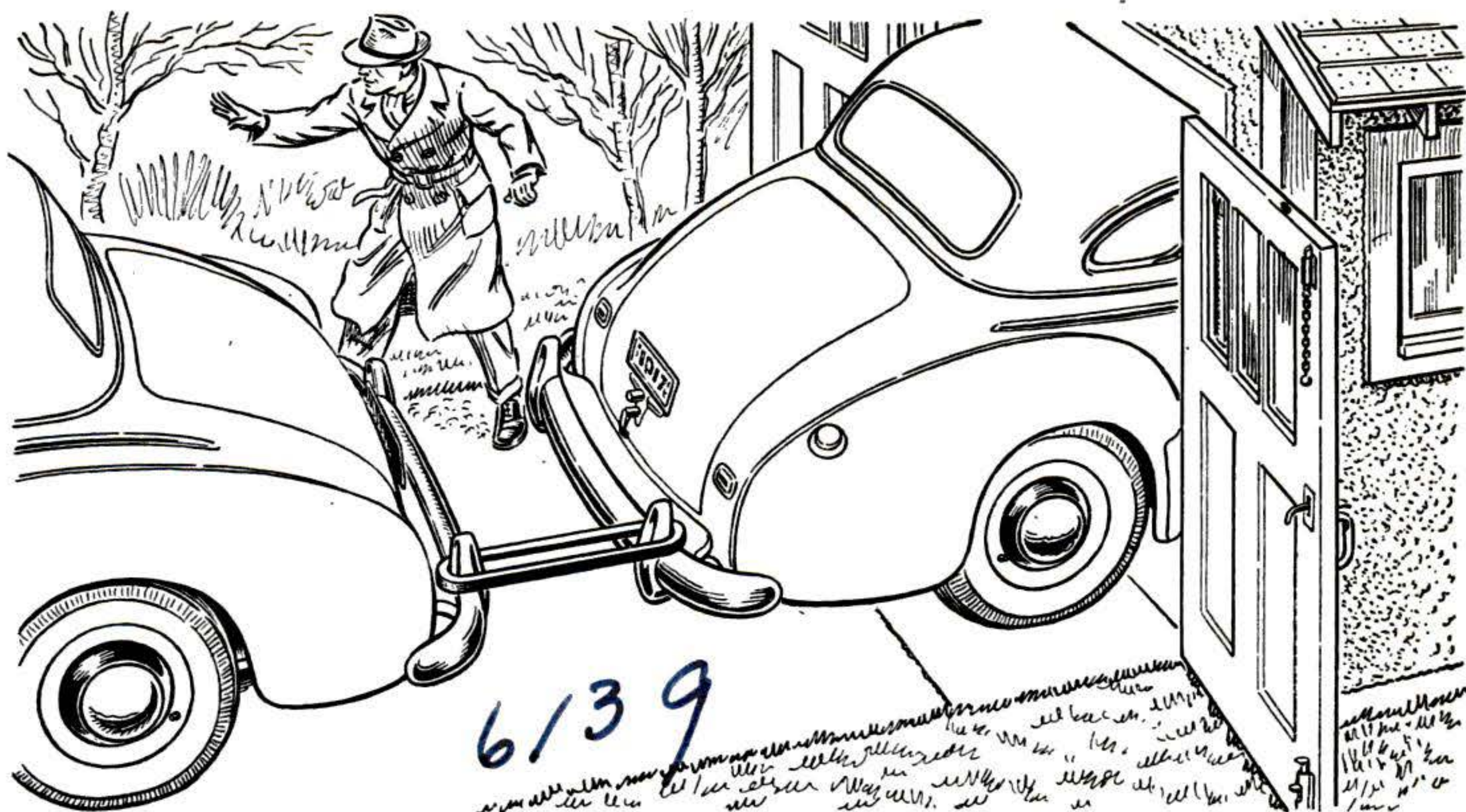
Straps Hold Back-Seat Items. If you own a convertible, here's a hint that may be useful. David A. Wallace, of Ada, Mich., suggests that one or more elastic straps placed around the rear cushion will keep papers or loose clothing from blowing out while the top is down. The straps won't interfere with passengers.



Shield Protects Generator. While filling up with oil, you may have noticed that the attendant sometimes allows a little to slop over the filler tube. Ray Wolfram, of Chicago, writes that he finally traced a mysterious generator trouble to such carelessness. Spilled over the generator, the oil had fouled the brushes. To prevent this from happening again, he installed a metal shield as shown.



Reverse Sagging Handles. On some cars the door handles eventually wear enough so that they sag below the chrome strip they were designed to parallel. Don E. Braman, of Little Rock, Ark., found a simple solution for this on his 1941 Chevrolet. Removing the handles, he transferred each to the door on the opposite side. There, since the worn part was up, the handle didn't sag. Three minutes did the job.

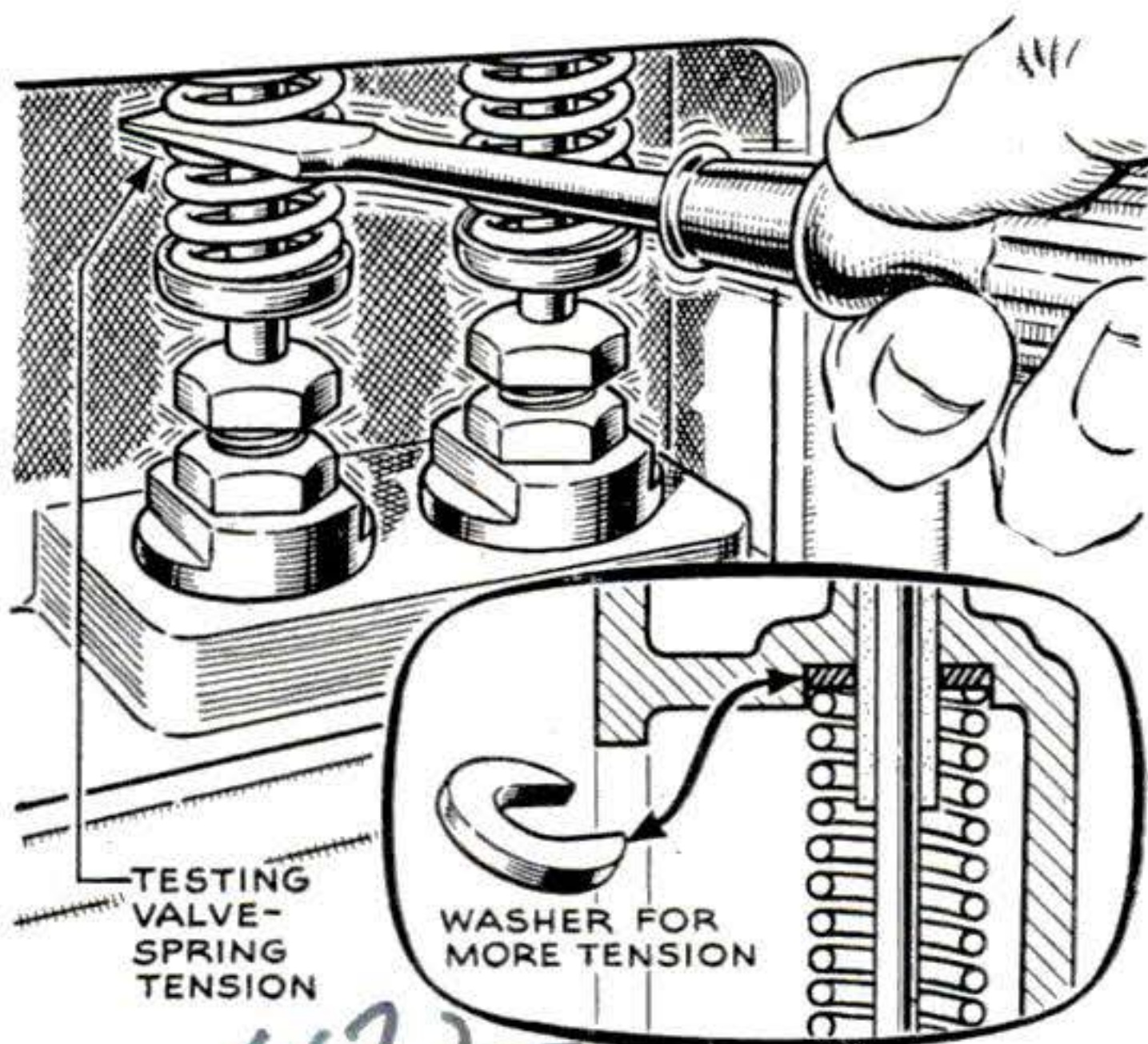


Fan Belt Gives Tow. Forrest F. Starr, of Columbus, Ohio, makes a suggestion that may help you out of a tough spot.

"My neighbor's car was stuck in soft ground," he writes. "Having no suitable rope or chain, I used an old fan belt. It

worked surprisingly well, for the stretch in the belt got the car started to rocking without any sharp jerks. I've carried the belt ever since for just such emergencies."

As seen above, the belt is especially good when you can't push the stalled car.



Washer Quiets Knock. A knock may occur at idling speed if the camshaft gear is worn and one or more valve springs do not have sufficient tension. W. M. Dierks, of Chicago, says such knocking usually can be quieted in the following way. With the engine idling, insert a screwdriver into each spring. When the knock stops, you've found the faulty one. Force a horse-shoe washer 1/16" thick under the seat.



Plastic Keeps Door Clean. Most everyone these days installs seat covers in a new car, but few give any thought to the door areas, where hands frequently soil the covering material. Frank J. Montemuro, of Philadelphia, is one person who does. Cutting a sheet of clear plastic to fit, he installed it as a shield around the door and window handles on each door. The plastic is easily wiped clean.

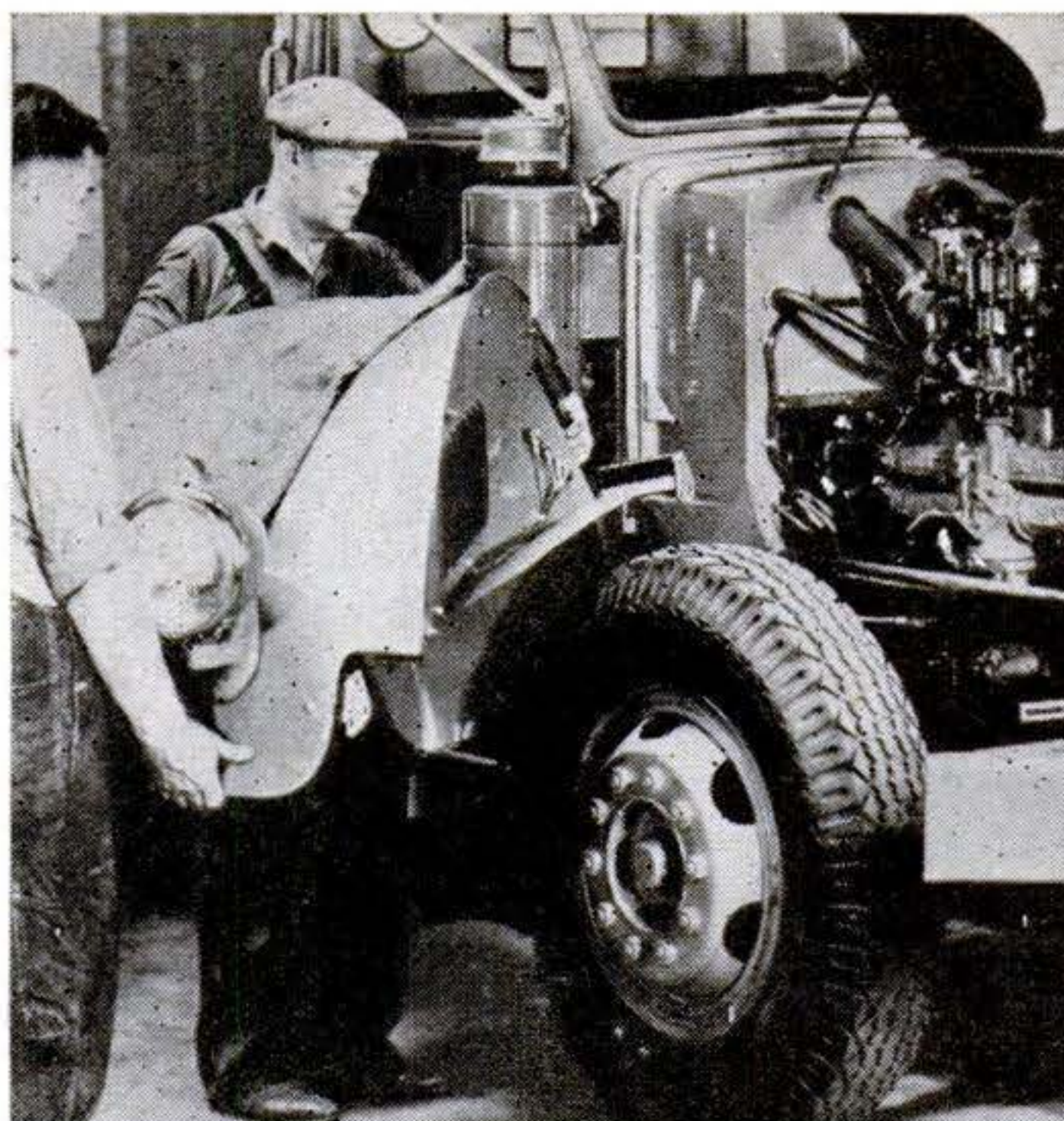
6177

Fenders Lift Off for Engine Work

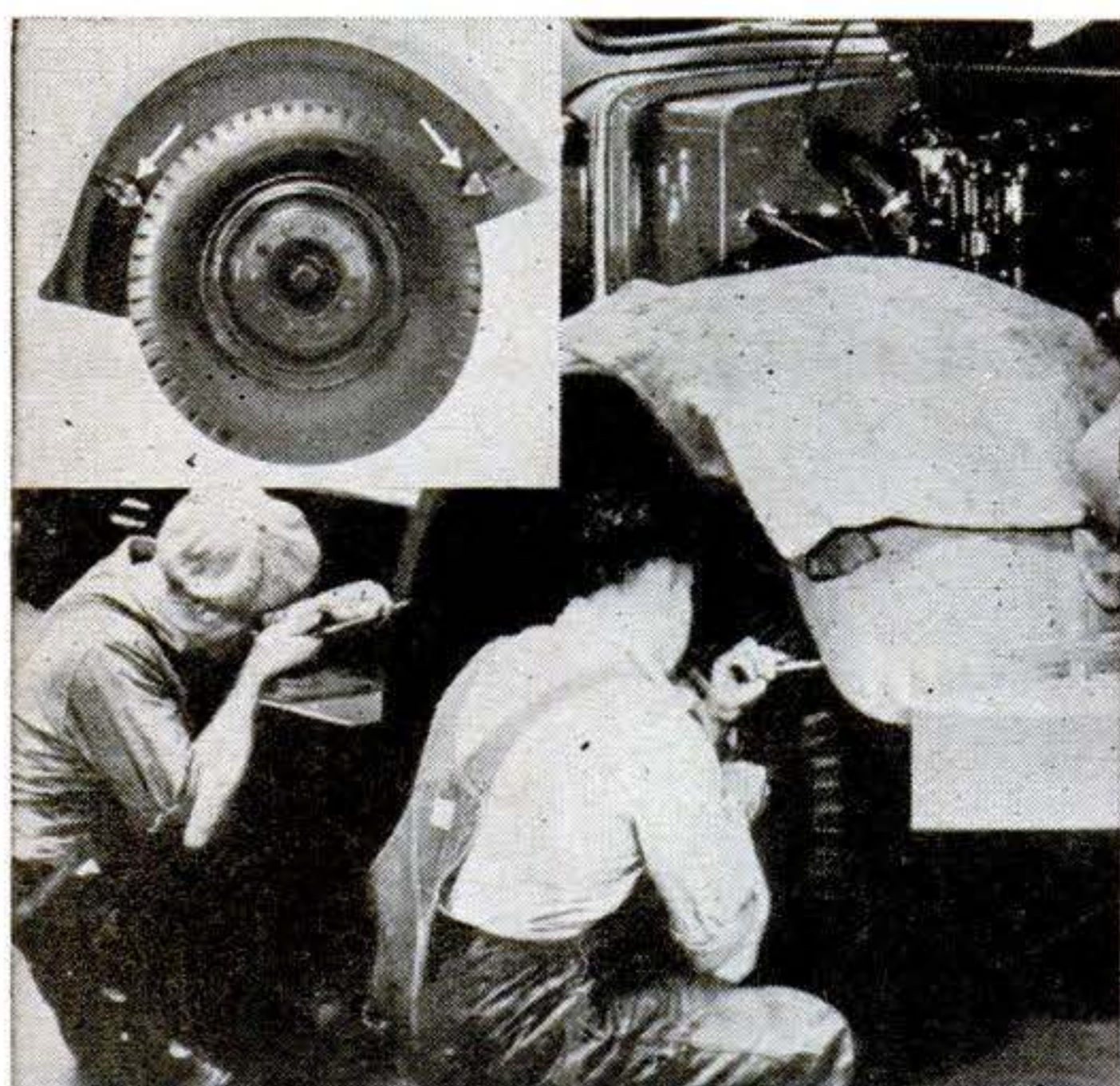
ENGINE repairs are a cinch on the new extra-heavy-duty truck models just announced by Diamond T. Now you have to be just a mechanic—not an acrobat too.

The engine's still hidden deep between two high-riding fenders, as it is in many cars. But there's a big difference. The fenders are quickly and easily removable when the engine needs attention. Eventually, all Diamond T trucks will have this feature.

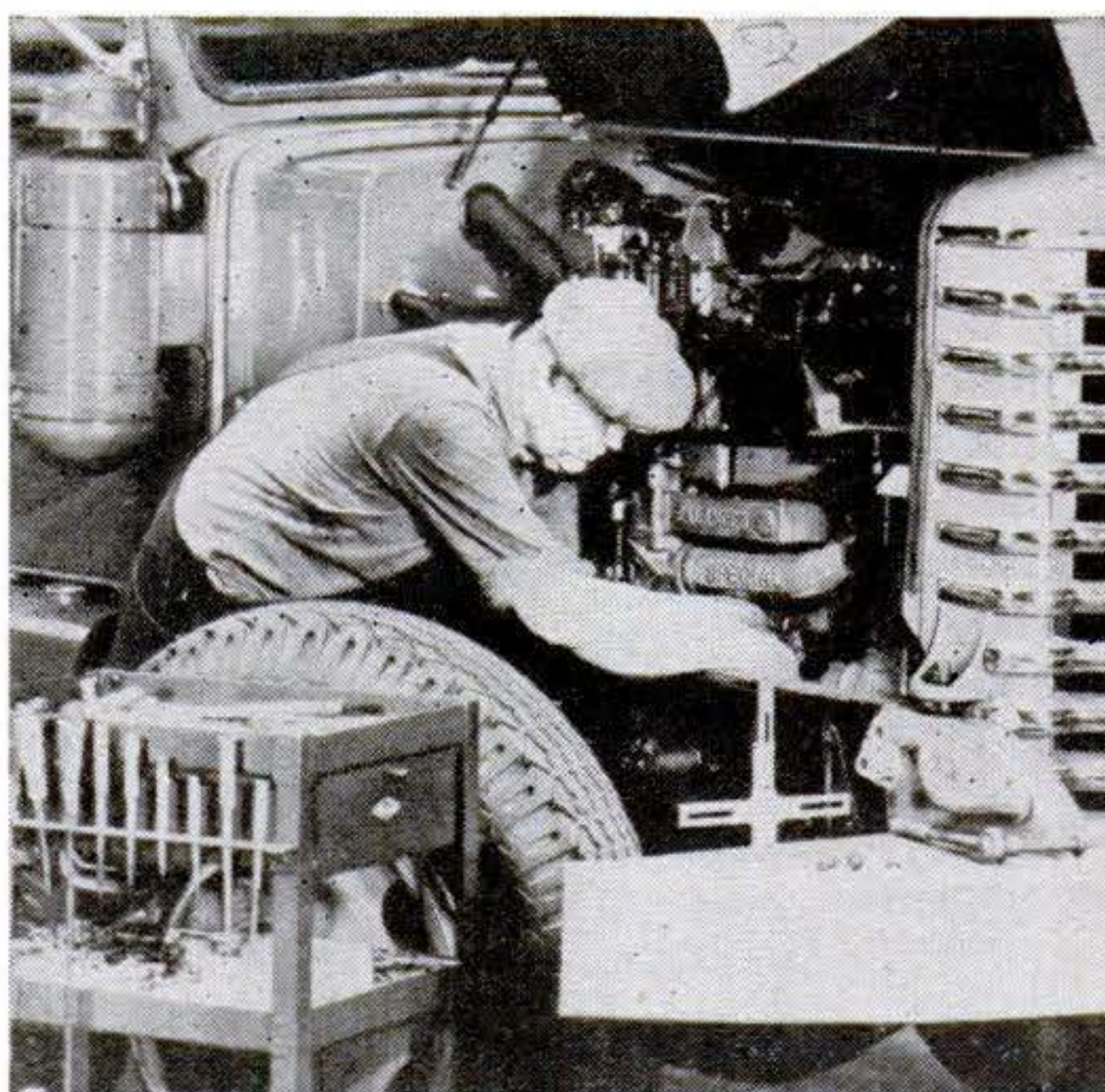
It's expected that every repair job below the cylinder-head level will be speeded up considerably. Not only can the mechanic work more comfortably; he can use power tools that previously were out of the question because of the cramped space.



Get it out of the way! Fenders are detachable on extra-heavy-duty trucks made by Diamond T.



Five minutes do the job. Working together, two men quickly remove the bolts (arrows) at each end of shield. These hold entire assembly.

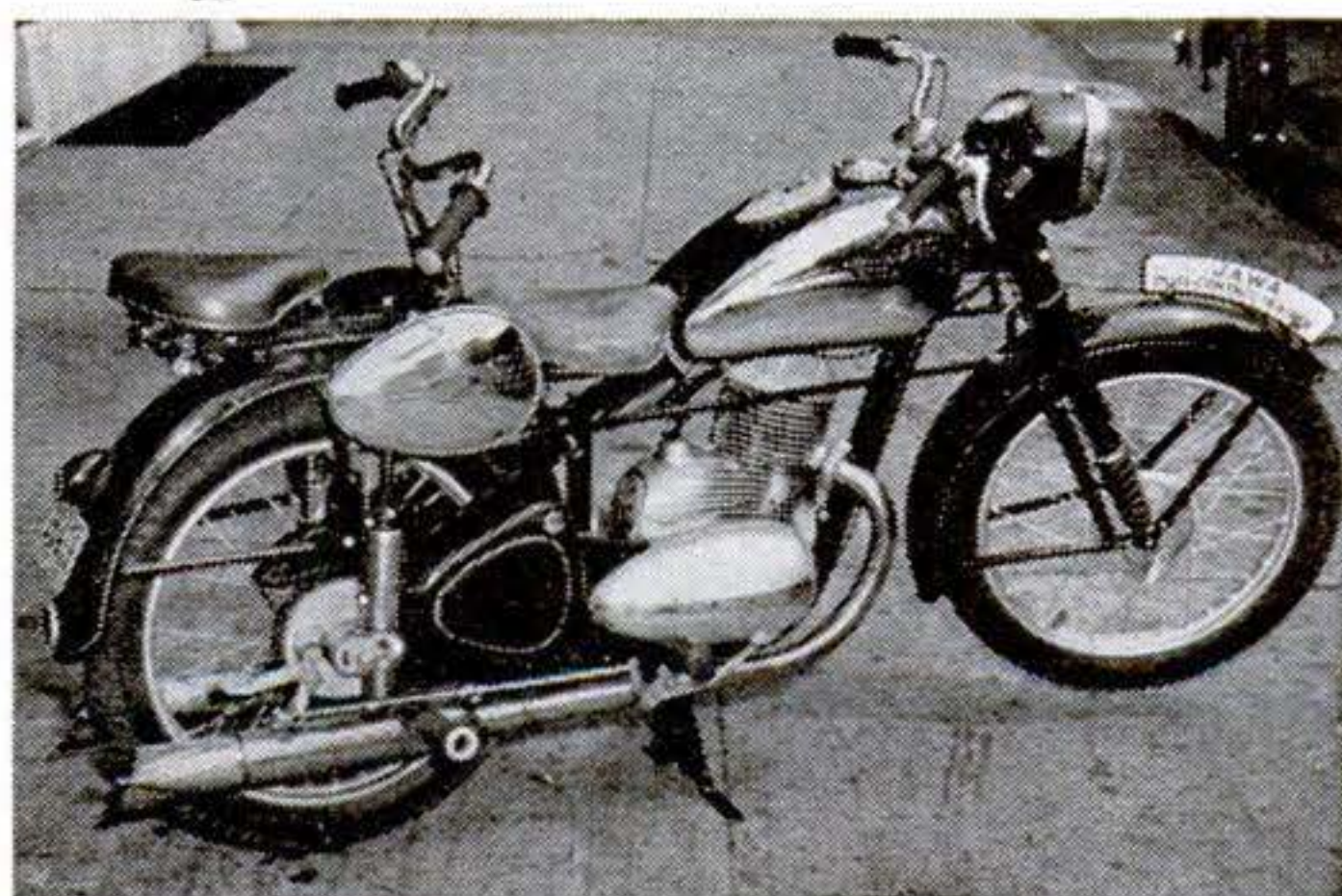


Now you can get at the engine. There's no need to stand on your head. The fender's gone. Note how readily mechanic can reach his tools.

Dual-Control Motorcycle Helps You Learn to Ride

HERE'S a way you can learn to ride a motorcycle with ease. While the student rides in front, an instructor sits behind.

Manufactured in Czechoslovakia, the trainer is distributed in the United States by Industrial Operations, Inc., of New York. It was developed from a standard 250-cc. Jawa (PS, Aug. '47, p. 140). The handlebars turn in unison, and either rider can operate the clutch and brake. There's only one gear lever, but it's within reach of the instructor as well as the student.



6018



Foot shift, above, is found on both of the new Indians. You press up to shift up, and down to shift down. At right is the Gold Arrow, deluxe one-cylinder model. Note the new hydraulic fork. Top right you see cast aluminum cylinder head of the overhead-valve engine. Short push rods activate rockers in finned, ear-like housings.



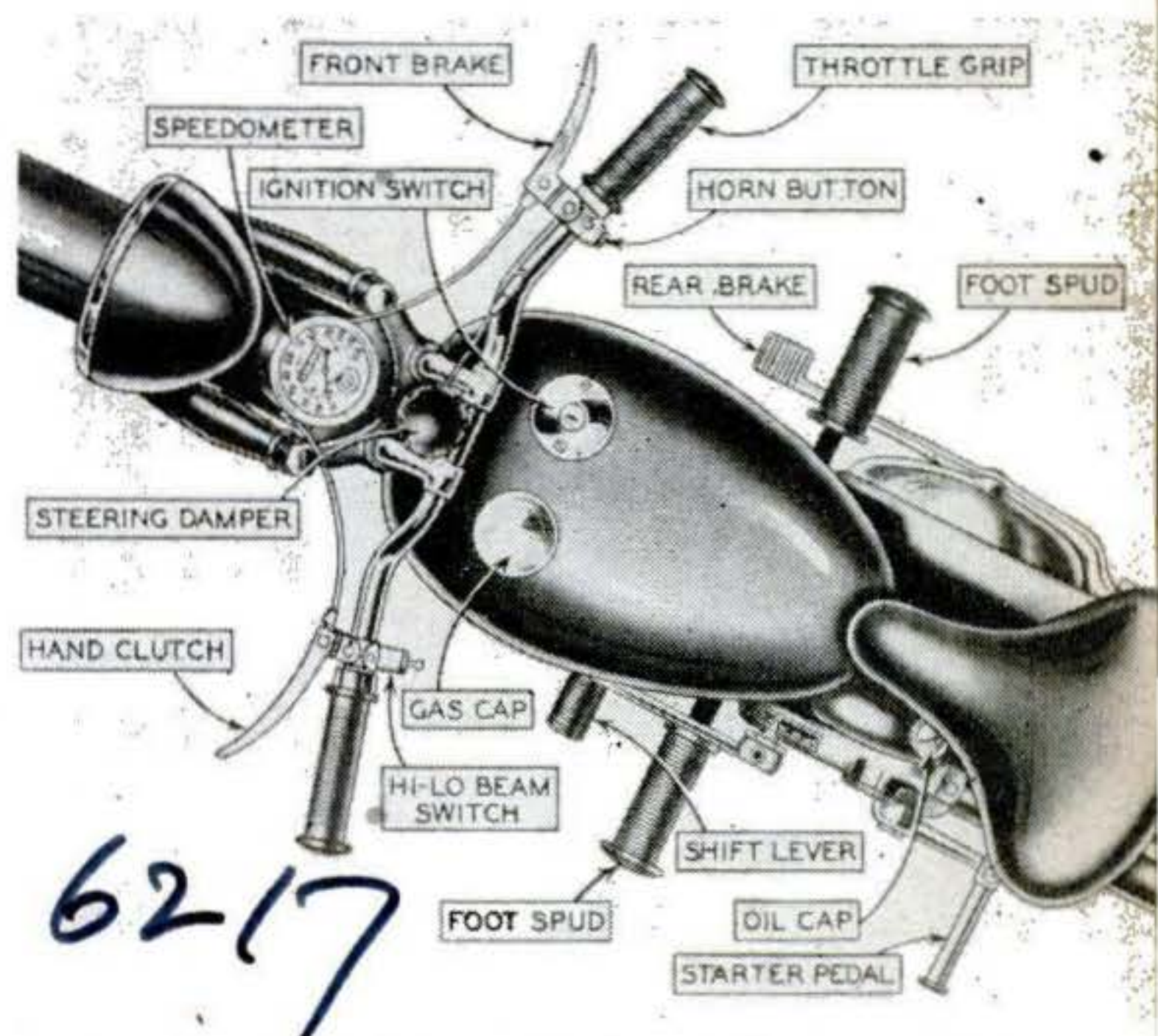
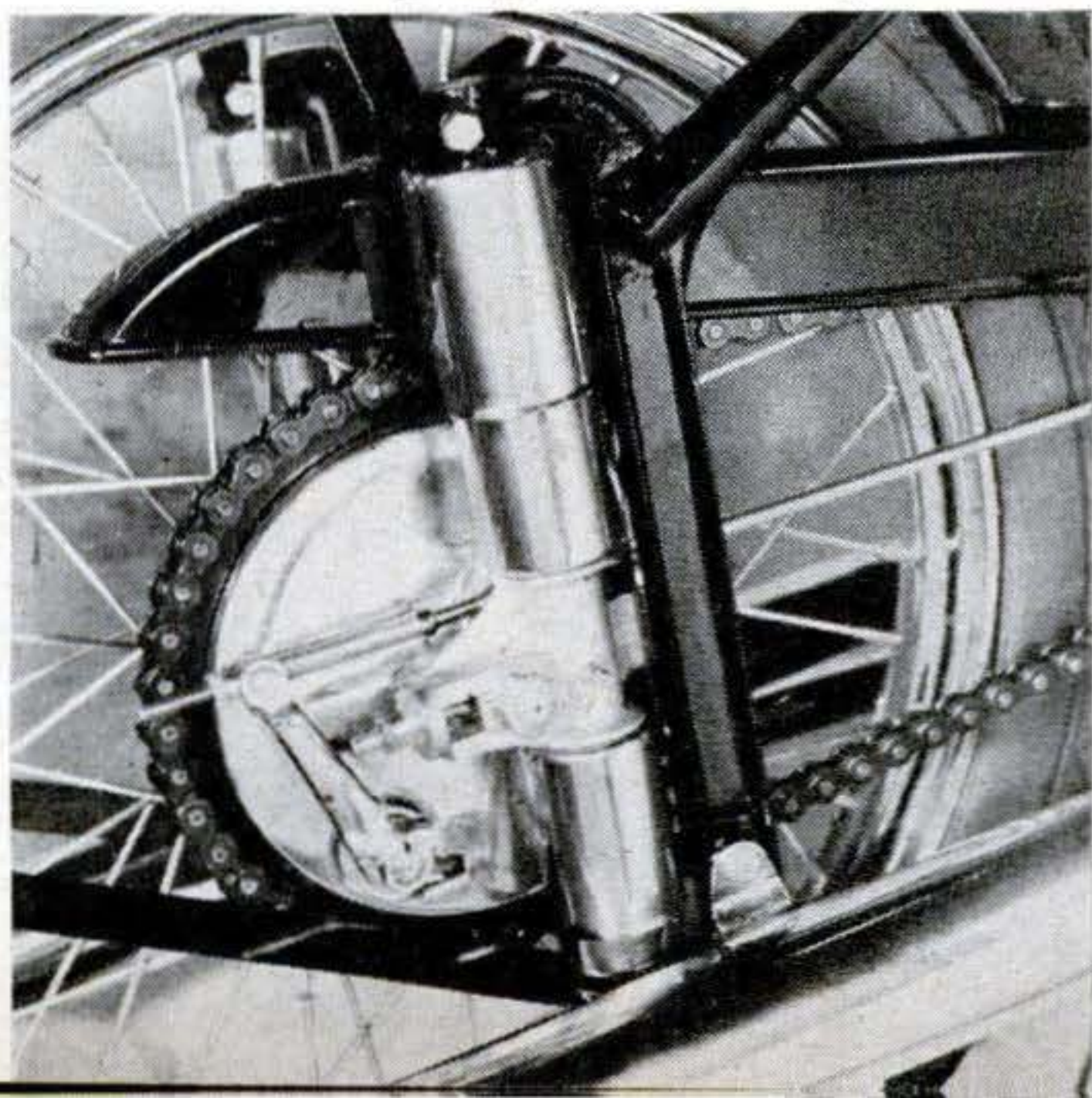
Overhead Valves Power Two New Indians

IF ALL insignia were removed, you'd have trouble identifying the new lightweight Indians. The Indian Motorcycle Company has never before made anything like them.

Both of the new series are powered by 7-to-1 overhead-valve engines. You shift by foot, operate the clutch by hand. You have a three-speed transmission with overdrive. Instead of exposed springs, you find a telescopic front fork. The one-cylinder Arrow weighs 240 lb., the twin Scout 275.

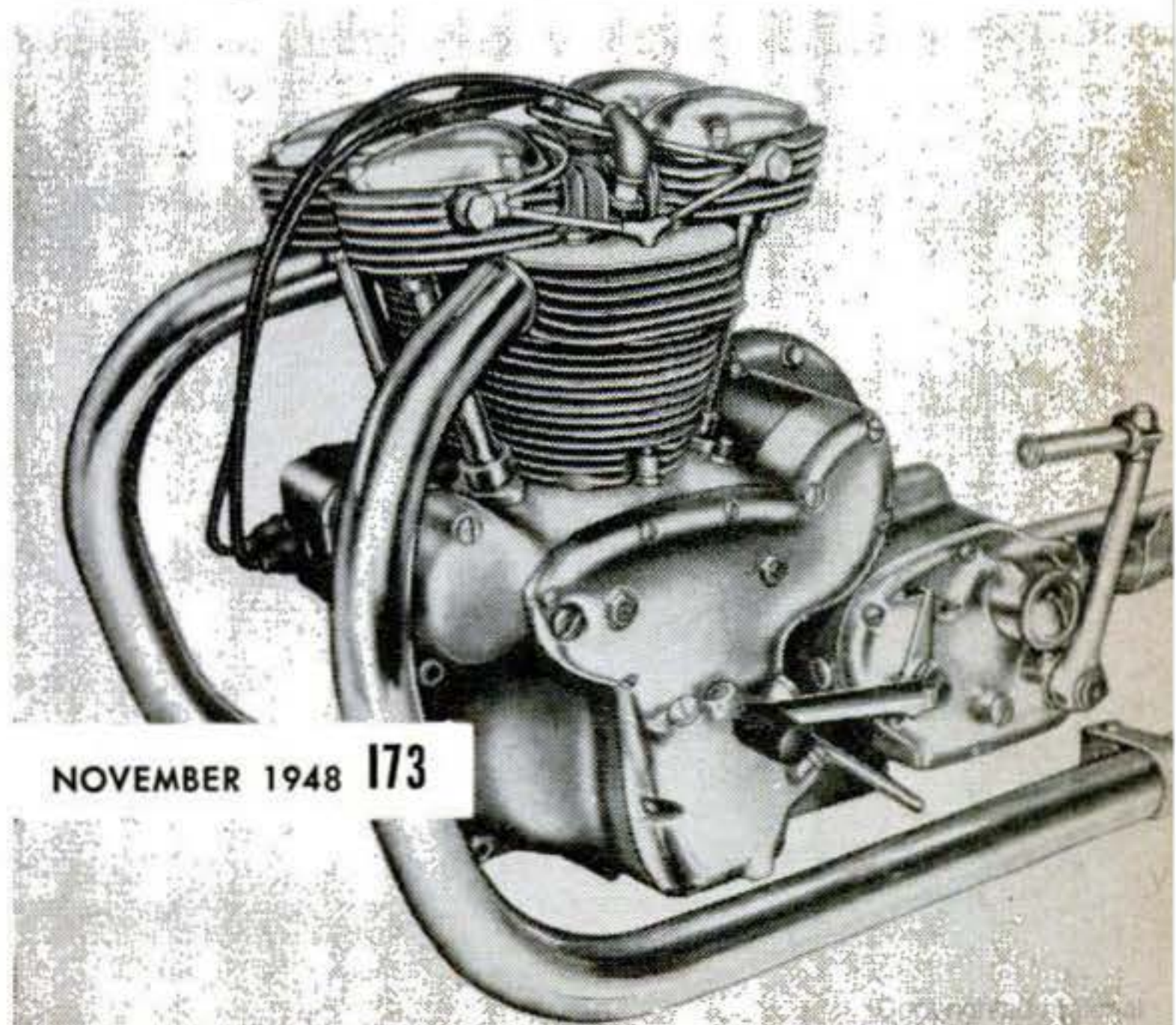
Displacement of the single is 13.3 cu. in., of the twin just twice as much since the bore is 2.375" and stroke 3" in each. These overhead-valve engines were designed especially for the new Indians. Features include bronze valve guides, valve seats, and spark-plug inserts in an aluminum head. The Arrow cruises at 60; the twin has a top speed somewhere in the 90's.

Coiled spring shock absorber of the plunger type carries the rear wheel, taking bumps out of the ride and giving better braking.



Controls are relocated for safer operation. Once under way, you can keep your feet on the spuds and your hands on the handle bars.

Side by side vertical twin engine is used in new Indian Scout. Both of the new engines have magneto ignition with automatic spark advance.



Gus Adds



Palmer filled the two-quart measure full of water and dumped it into the gallon container.

Ray Quinley

6072 5391

Two and Two

But it doesn't always come out four, as a new customer proves in the case of Silas Barnstable and the missing antifreeze.

2+2=?

By Martin Bunn

LIKE most young auto mechanics who are worth what they get out of their pay envelopes, Stan Hicks loves to figure out new ways of doing things. Sometimes his ideas work out swell. Sometimes they don't.

Stan noted the time on the clock in the Model Garage and had to admit that this was one that hadn't worked out. He had masterminded a new method of truing a brake drum. It had looked good, but the work had taken him twice as long as it should have. He confessed as much to Gus Wilson.

The older man smiled. "We'll charge the customer for the time the job should have taken you," Gus said, "and charge the rest of it to experience."

Stan didn't say anything—just looked back toward the brake-drum lathe.

"Look here, kid," Gus went on, "I don't want to cramp your style, but you'll duck a lot of headaches if you'll remember that most shop operations have been done so many times that there's darned little chance of improving them. Two and two always add up to four. You can't get away from that fact."

"The dickens you can't," snapped a positive voice behind them. "A lot of people have gotten away from that so-called fact. Einstein has. And so have I."

Gus and Stan turned to stare at the owner of the voice. He was a tall, lean young man whose old-fashioned spectacles gave him a professorial look. The stranger grinned at them—a wide and entirely likeable grin.

"Excuse my horning in," he said, "but whenever I hear someone voice a fallacy, I have to up and speak my piece. I admit it's a bad habit and it puts me in wrong with people who aren't used to me. My name's John Palmer. I'm the new high-school chemistry teacher. I'm looking for Gus Wilson."

Gus laughed. "No need to look farther."

Palmer looked him over frankly. "They tell me you're a champ mechanic. I've brought my car around to you. There's something wrong with it that you can't fix."

"If you're so sure of that," Gus asked, "why bring it to me?"

"Want to show a friend of mine that he's wrong," Palmer told him. "I'll get the car." He stepped out of the shop and moments later drove a well-kept coupe into the garage. "Listen to that engine," he said.

Gus listened for half a minute. "Smooth as cream," was his verdict.

"Right," Palmer agreed. He took his foot off the accelerator. "Listen again."

"Idles perfectly," Gus said.

"Right again," said Palmer. "But how about this?" He pressed his foot sharply down on the gas. For a few seconds the engine galloped and ran roughly. Then it smoothed out again.

Gus nodded. "Not so good when you tramp the accelerator open from the idling position. That could be caused by . . ."

"I know," Palmer interrupted. "It could be caused by clogged carburetor jets—but it isn't. The fellow who came up with that diagnosis cleaned the jets."

"May be burned-out distributor points," Gus said.

"Could be," Palmer said, "except another mechanic made that guess a week ago and put in new points."

"Improper valve-tappet adjustment—" Gus began.

"Could make an engine act like that," Palmer finished. "True, but the valve-tappet clearances have been checked and re-checked. They're okay."

"How about a bad condenser?" Gus asked.

"That also could be," Palmer answered, "but the man who swore the condenser was

The chemistry teacher grinned at Gus. "Bet you didn't find anything mechanically wrong with my car."



no good put in a new one. Didn't do a bit of good."

"Well . . ." Gus started to say.

"Wait a minute," said Palmer. "I'll tell you what's wrong. It's the gas we get these days. I've specialized in the chemistry of petroleum, and I tell you that today's gasoline—you know anything about chemistry?"

"Nope," Gus said, "and I don't know much about mathematics either, but I still believe two and two always make four. If you want to leave your car here a few hours, I'll find out what's wrong with it and fix it—or I won't charge a cent."

"Fair enough," Palmer grinned. "But you're wasting your time. I know it's the gasoline. Suppose I come back at four o'clock?"

"Okay," Gus agreed.

KNOW-IT-ALL kind of a guy," Joe Clark observed, coming up to Gus after Palmer had left. "I don't get that business about two and two not making four." And if anybody knows about two and two adding up to four, it's Joe. Ever since he and Gus have been partners, Joe has taken care of the front office and the bookkeeping.

"Oh, he's probably a good egg at heart, though," Gus said. "Maybe I can show him he doesn't know as much as he thinks he does—about gasoline and cars, anyway. I've got a pretty good idea what's wrong with his engine. A little checking—now look what the wind blew in."

Joe turned to see what the wind had blown in. It was old Silas Barnstable, our town's leading tightwad. Silas announced that he wanted some antifreeze.

"You better go see one of those cheap skates you do most of your business with," Gus said flatly. "Try the one who sold you

that stuff that clogged your radiator last year." Gus beckoned to Stan to come along and walked back to the brake-drum lathe.

"Wasn't the antifreeze that clogged my radiator," Silas yelled after him. "And you can't blame a man for buyin' cut-rate when he gets a chance. Dollars don't grow on trees, you know."

"Okay, okay, Silas," Joe said quietly. A customer's a customer to Joe, even if he's twice as ornery as old Silas. If that's possible.

"I want a good alcohol antifreeze and I'm willin' to pay for it," Silas said, still talking loud. "If you don't stick me as if I was buyin' champagne," he added.

"We're handling a standard alcohol antifreeze," Joe told him. "Mixed with water, half and half, it'll protect your engine down to twenty below zero. I'd say your radiator'll hold . . ."

"Four and a half gallons. I measured it," Silas said.

"That's eighteen quarts," Joe calculated. "So you'll need nine quarts of antifreeze."

"How much a quart?" Silas demanded.

Joe told him.

"That's outrageous," Silas stormed. "I ain't made out of money and that stuff ain't made of gold." Then, as Joe didn't answer: "All right. But it's profiteering."

Joe laughed. "Drive your car in and Greg'll put it in the radiator for you."

"No he won't," Silas snapped. "It ain't cold enough yet and maybe it won't be cold enough for a couple more weeks. I ain't gonna waste good money boilin' away antifreeze in weather when it ain't needed. That's why I brought this can."

"All right, all right," Joe said. "So take it home with you. When you're ready to use it, just add an equal amount of water."

"That won't do neither," Silas objected. "I got to use mighty hard well water out where I been livin' since I moved out of that outrageous-priced Hillside apartment. That's what clogged up my radiator—the hard water, not the antifreeze. I want you to mix my antifreeze with city water."

"Okay," Joe agreed patiently. He called Greg Jones, the grease monkey. "Pour nine quarts of antifreeze into this can," Joe instructed, "and add nine quarts of water to it. Be careful, now. Nine quarts of antifreeze and exactly nine quarts of water. And screw the cap on good and tight so the antifreeze won't evaporate."

"Yes, sir," Greg said, "nine quarts of anti-

freeze and exactly nine quarts of water."

"That's right," Joe told him. "Hop to it."

Greg did, and as Silas stalked out with his can, Gus looked up from his job.

"I wonder," he mused aloud, "whether he'll be back today or tomorrow."

"What d'you mean?" queried Joe.

"I just remembered that our friend Palmer may be right—sometimes," Gus replied with a mysterious grin. "You're good at math. When does two and two not make four?"

JOHN PALMER and four o'clock arrived at the Model Garage exactly together.

"Bet you didn't find anything mechanically wrong with my car," he grinned. "I think you'll wind up agreeing with me that it's the gas."

"Your engine's rough acceleration," Gus smiled, "was caused by a weak spring in the vacuum spark-advance unit. That allowed the spark to advance faster than the throttle opened. I fixed it for the time being by stretching the spring, but you'd better have a new vacuum unit put in."

Palmer's long jaw sagged. For a moment he looked deflated. Then he rapped his head with his knuckles and laughed. "Wrong again. How'd you find out what it was?"

"Added two and two," Gus answered. "They made four just like they always do."

"There's that fallacy again," Palmer said. "I'll prove to you that two plus two doesn't always equal four. Now just suppose . . ."

The shop door banged open. It was Silas Barnstable, lugging his five-gallon can. His seamed face was red and his thin-lipped mouth a straight line.

"I been cheated," he blazed at Gus. "You'll make good or I'll stand you a suit in court. That's what I'll do."

"Now what's eating you?" Gus asked quietly. Joe Clark, attracted by the uproar, stepped out of the office, pencil in hand.

"I been defrauded," Silas grated. "That boy of yours short-measured me on this antifreeze. Soon as I got home I tested it with a hydrometer to make sure he'd given me a fifty-fifty mixture. That was all right. But then I measured it and there wasn't eighteen quarts. No, sir, it was darned near a pint short. I got a refund comin' to me and I'm gonna get it."

Joe looked reproachfully at Greg Jones. "I told you to be careful."

"I was careful," Greg protested. "I measured out nine quarts of antifreeze and nine quarts of water, and I screwed the cap on

good and tight so none of it could spill out."

"I believe you, kid," Gus said.

"Then I'm a liar," Silas exploded.

"Keep your shirt on," Gus advised him.

"I don't doubt that the mixture was a pint or so short when you measured it. But I don't doubt, either, that Greg measured out nine quarts of antifreeze and nine quarts of water for you."

Joe Clark fidgeted. "I'm afraid he couldn't have, Gus. Nine and nine always add up to eighteen."

"There's that fallacy again," Palmer cut in. "Nine and nine don't always add up to eighteen any more than two and two always equal four. I told you I'd prove it to you. Let me have two quarts of that antifreeze, a two-quart measure, and a gallon measure. I'll prove it right now."

"Go ahead, Greg," Gus grinned. "Get him what he wants. I think Joe and Silas have got it coming to them."

Greg brought the things. Palmer filled the two-quart measure full of water and dumped it into the gallon container. Then he filled the measure with two quarts of antifreeze and slowly began to pour it into the water.

"You saw me put two quarts of water in the can," he said, "and now I'm putting in two quarts of this stuff. Two and two makes four. Or does it?"

With those words he poured the last of the antifreeze into the water. The mixture was well below the one-gallon mark.

"There's your proof," Palmer went on. "Chemists call it 'volume change.' When you mix a cup of sugar and a cup of water, the sugar dissolves in the water and the mixture isn't two cups. It's much less. Two quarts of alcohol and two quarts of water don't add up to fully four quarts. They intermingle and there's a shrinkage of about two percent. In nine quarts of antifreeze and nine of water that's nearly twelve fluid ounces—about a cup and a half."

"Well, I'll be doggoned," Joe exclaimed.

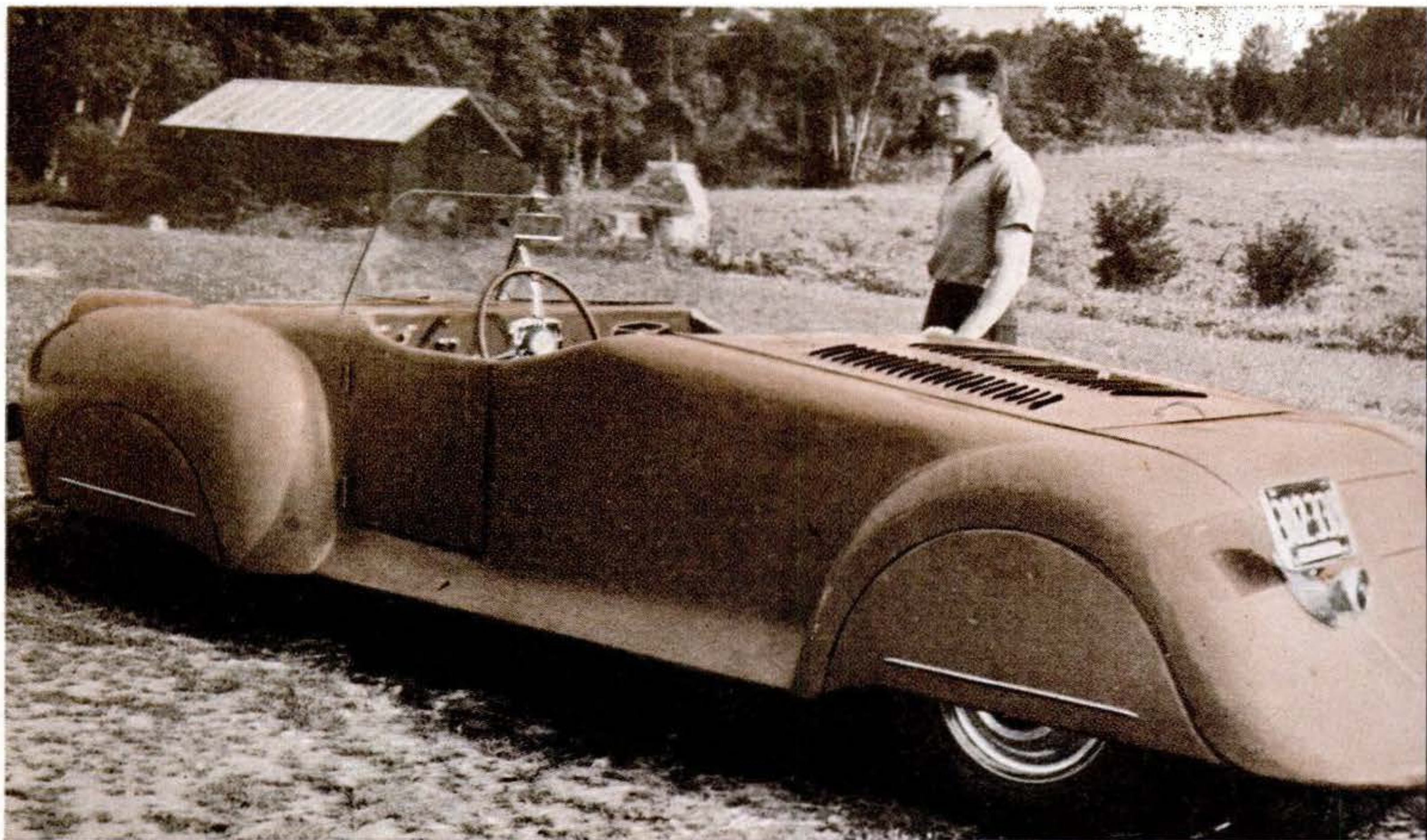
"I wouldn't," Gus said, "because I've seen it happen before and I knew Silas and Greg both could be right. But I'm glad we have a chemist here to make it official. Silas mightn't have believed me."

"Humph," snorted Silas. "Don't know as I do yet. Where I learned figurin', two and two always make four."

Gus looked at Palmer. They both laughed.

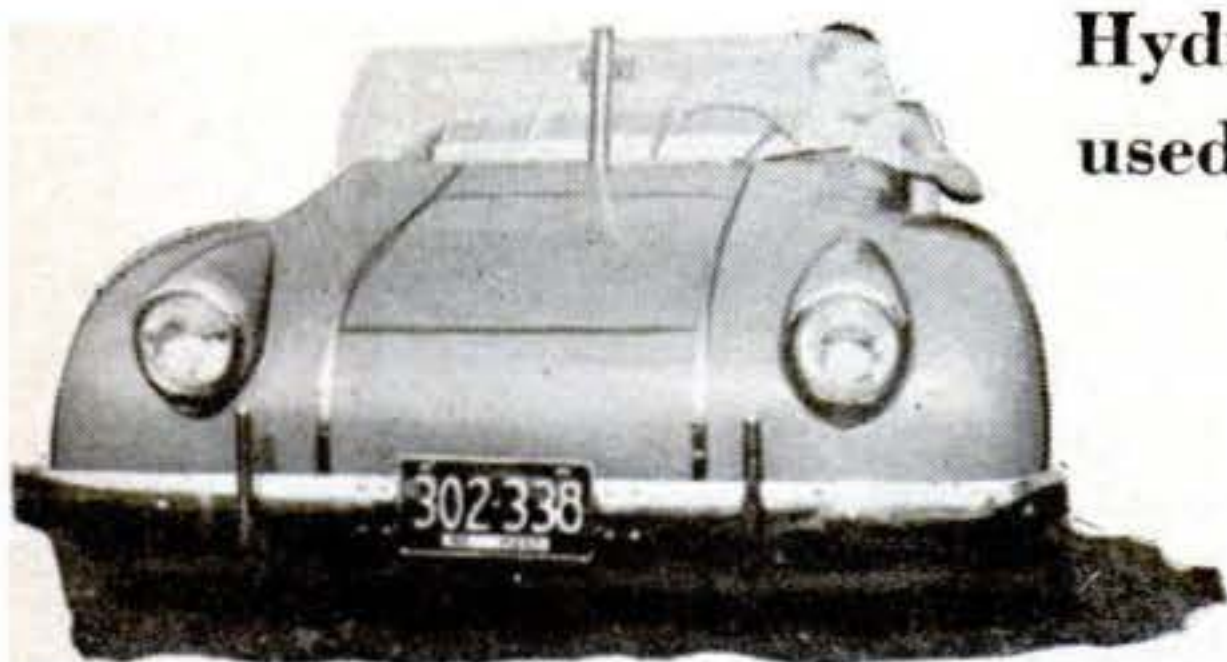
"I guess that's pretty good arithmetic," murmured Gus, "except when it happens to be wrong."

END



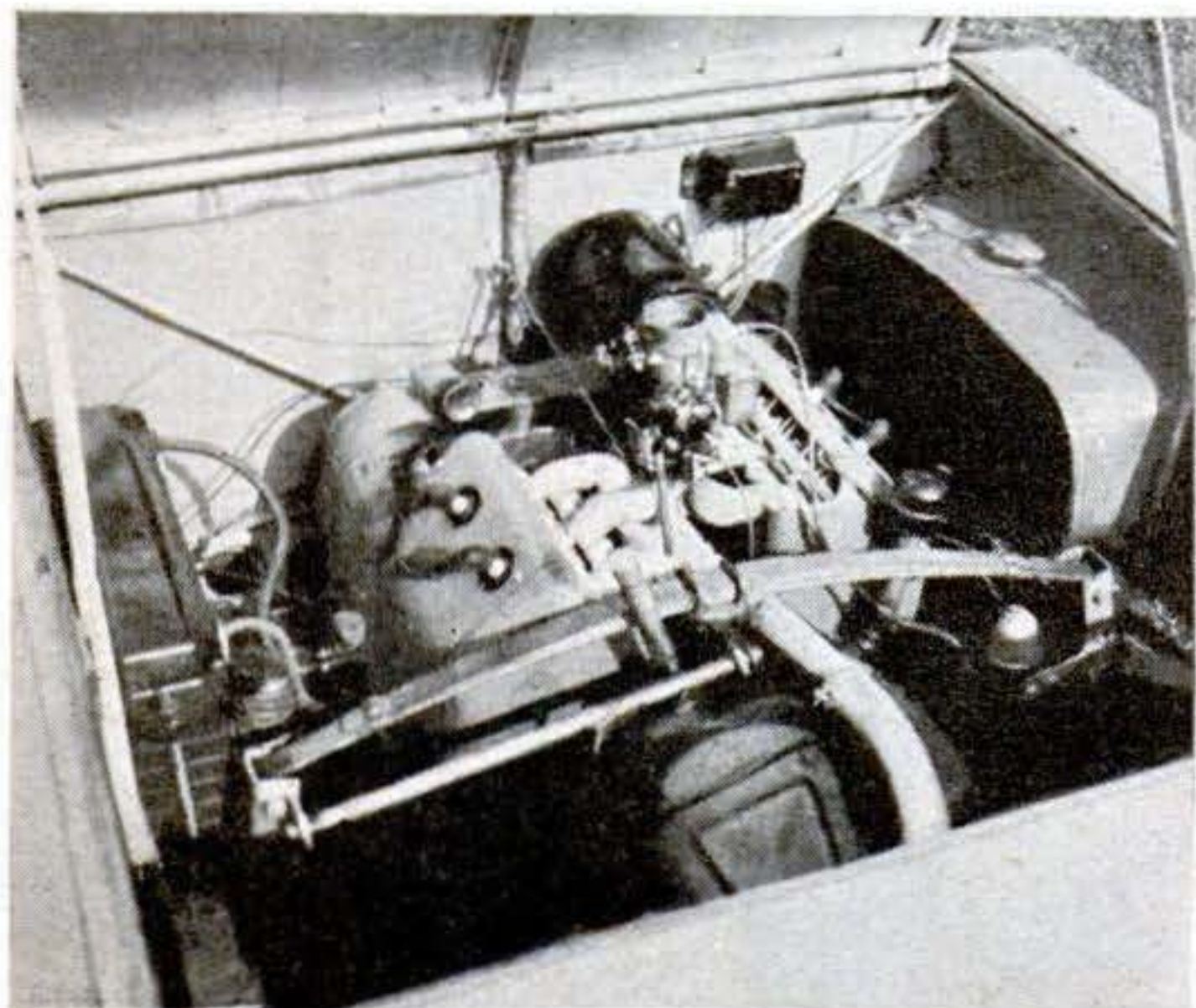
Built at home, the rear-engine "Walker Special" is so low it doesn't quite reach your belt.

\$250 and 3000 Hours

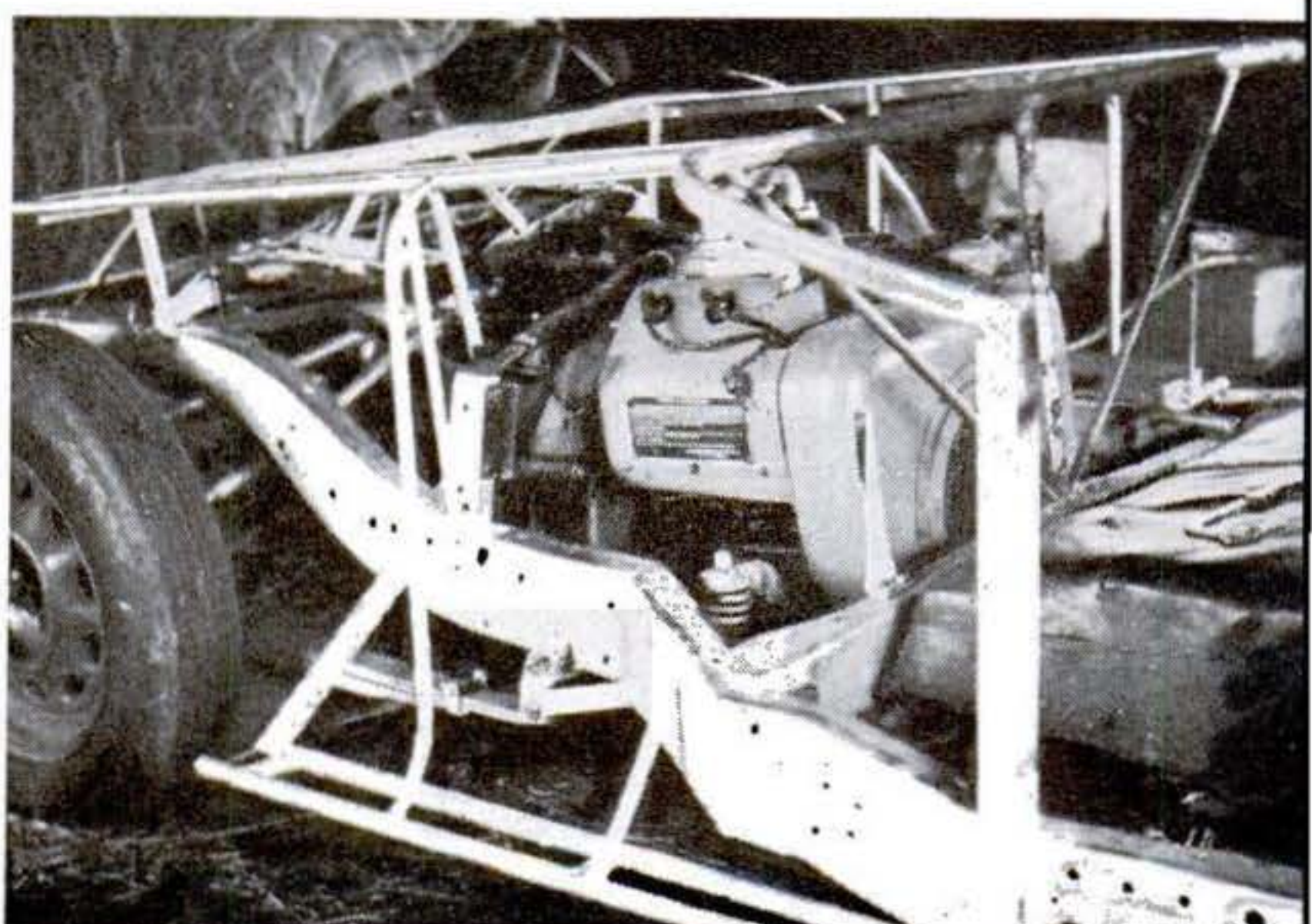


Hydraulic controls and rear-mounted engine are used in this homemade, road-hugging automobile.

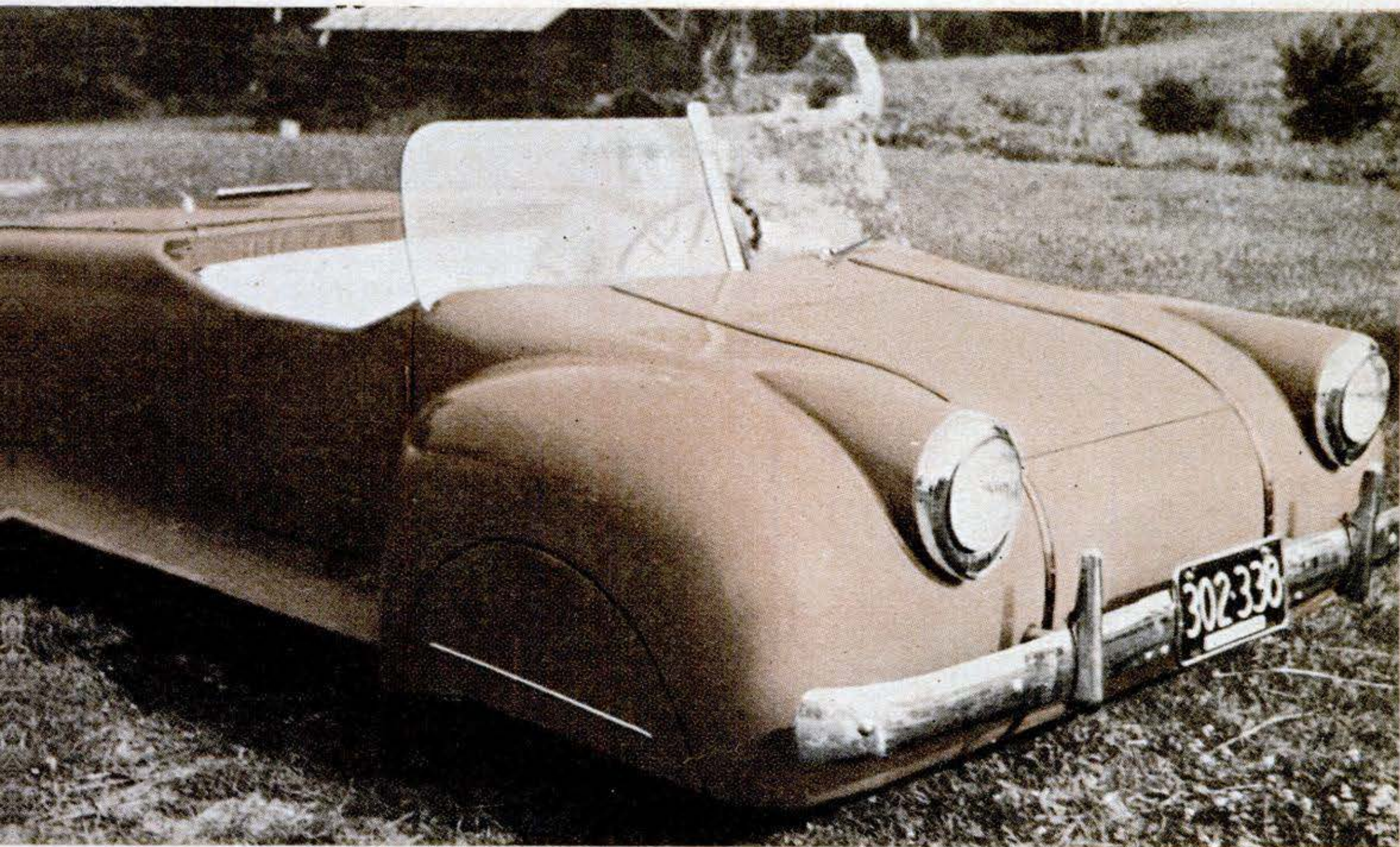
PUT back your pocketbook. At first glance, you may have hoped this was a car you could buy. But it's not for sale, nor any other like it. However, if you're a master



Air-cooled engine rests on springs. The first ones installed had to be beefed up to prevent



torque from twisting engine. Coils are used at the front (above), a cantilever at rear (left).



Although hammered out by hand, the sheet-metal body is smooth and entirely free of ripples.

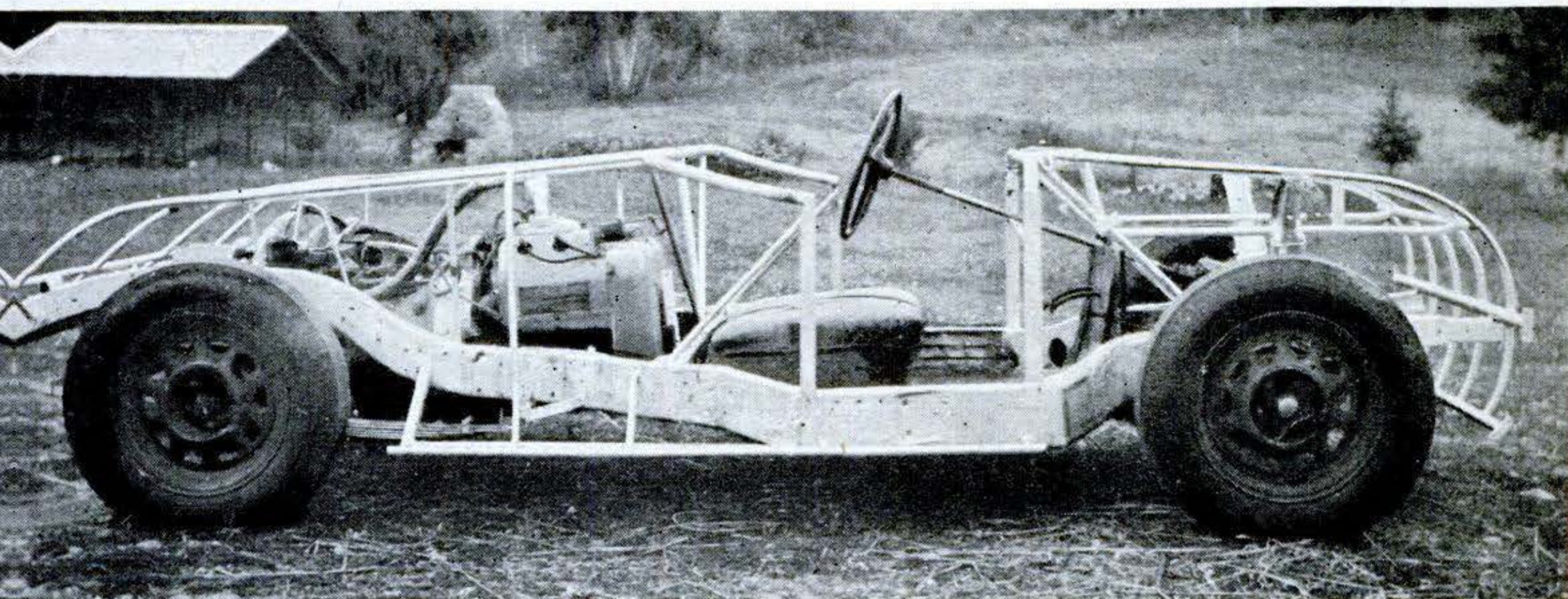
Produce a Dream Car

mechanic, you might duplicate it for about \$250. That's about what Paul H. Walker, of North Oxford, Mass., spent for materials.

The hitch is the job took him some 3,000 hours. Even so, the builder had a lot of able assistance. His wife worked right along with him, and the neat upholstery is entirely her handiwork. At last report, she was work-

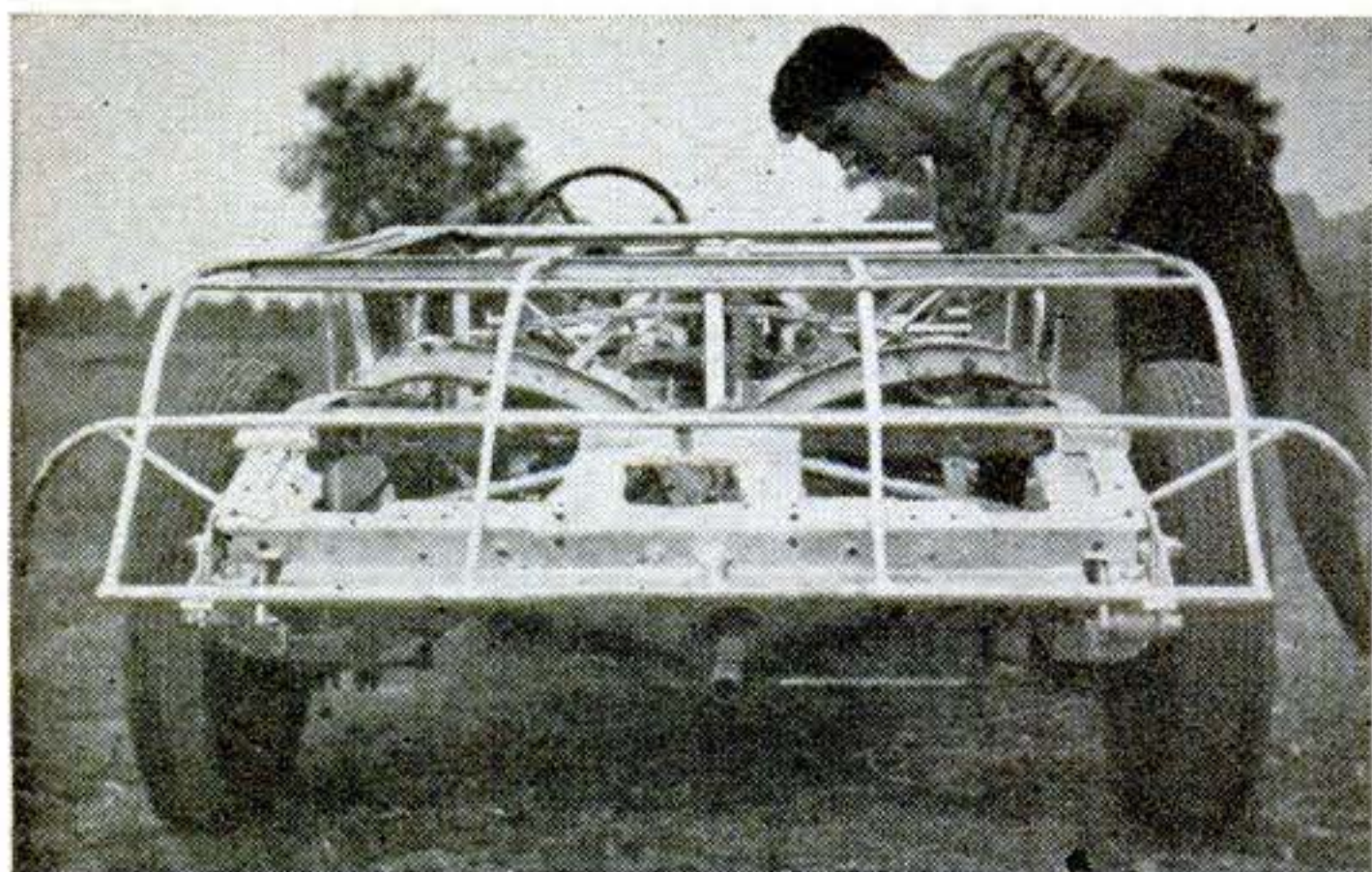
ing on the finishing touch—a canvas top with a zipper closure through which they'll enter and leave the car.

Registered as the "Walker Special," the light-green roadster is powered by an air-cooled V-4 engine set in the rear of the chassis. Designed for a fire pumper, the engine develops 20 hp., gives about 40 miles

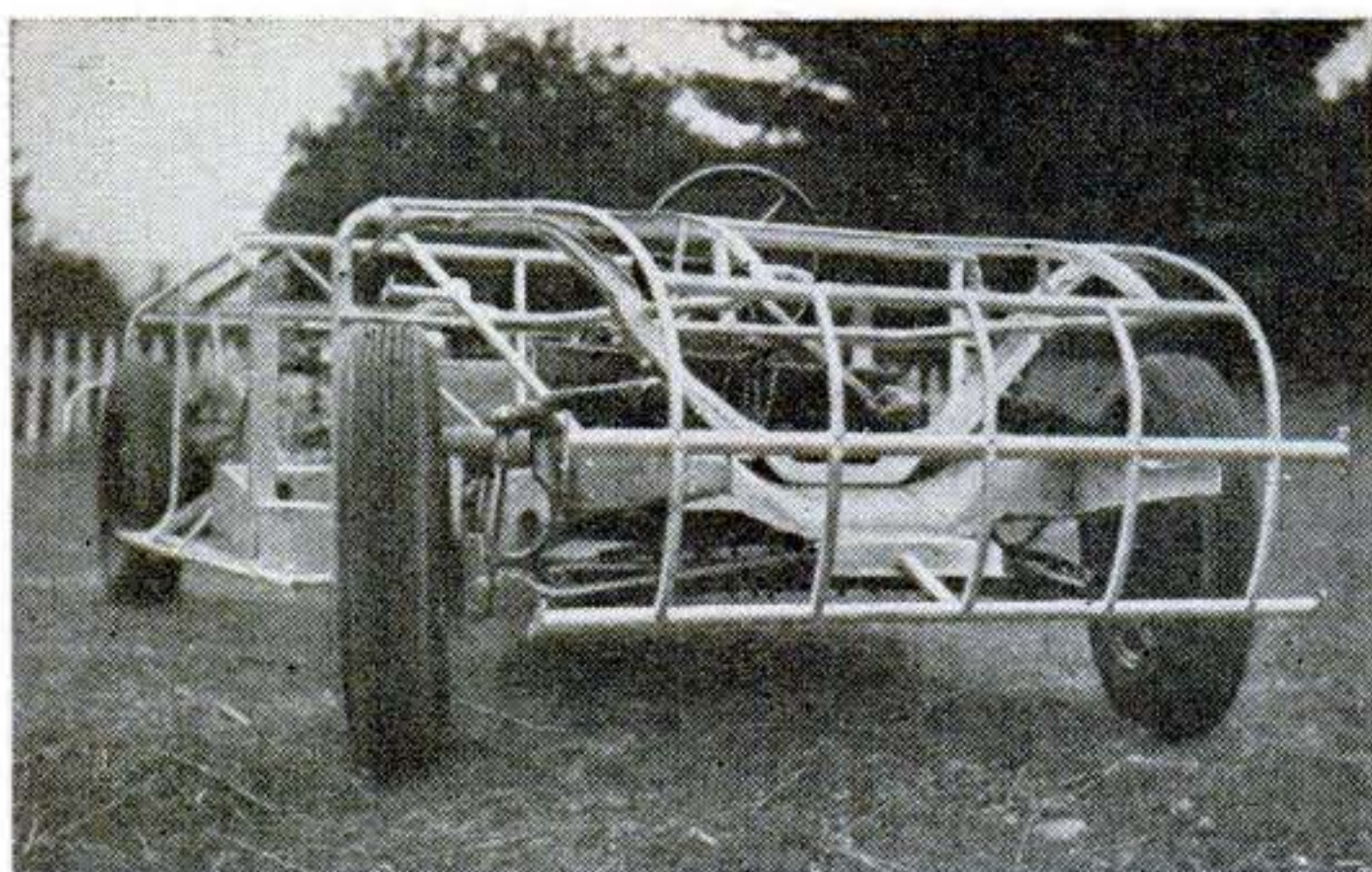


Steel tubing salvaged from two wrecked planes was cut, bent, and welded to form a framework

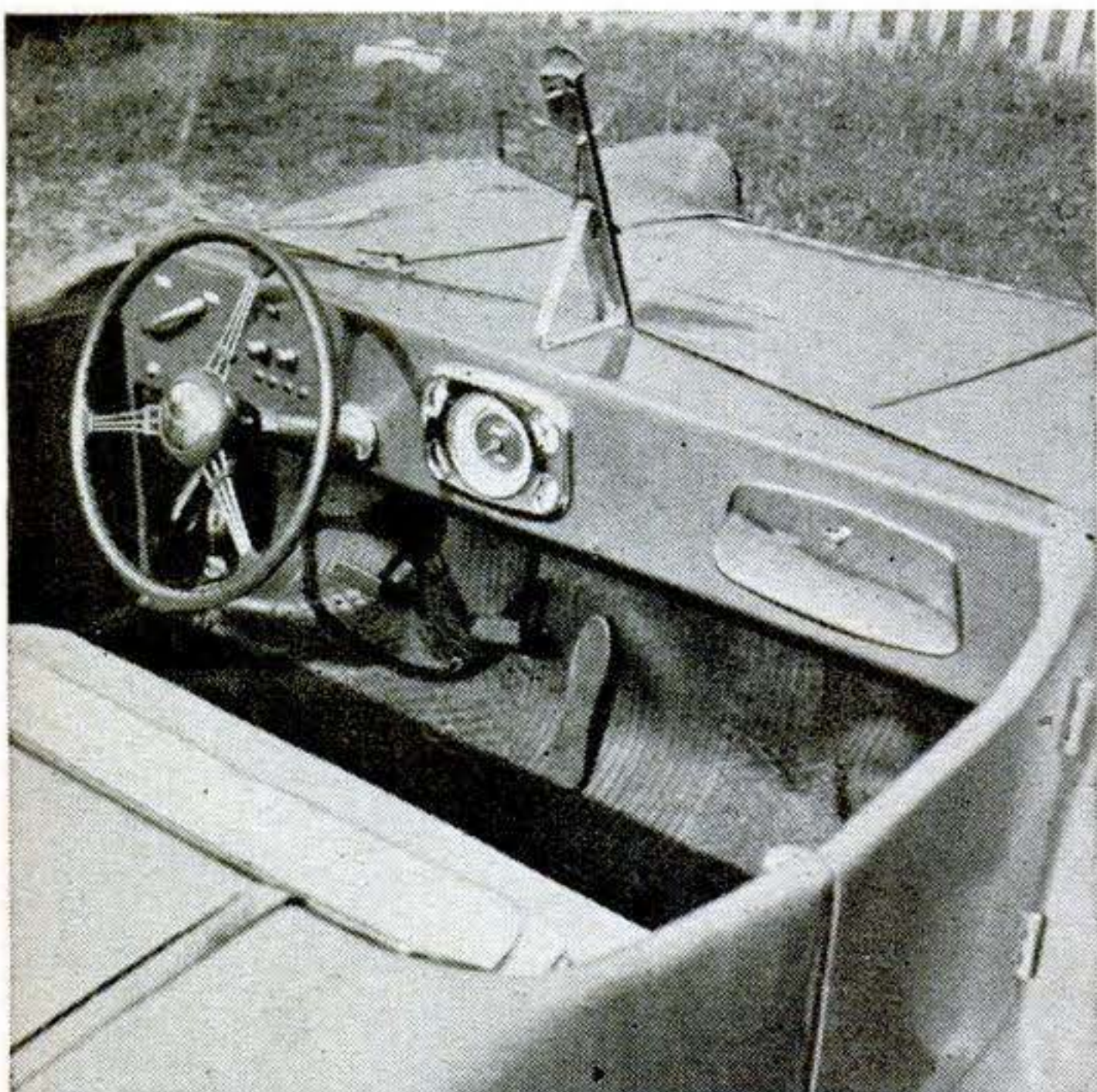
for the body. Not a single bolt was used. The wheels and main frame came from a junked car.



Extreme lowness of the body is emphasized by way the builder must reach down to the engine.



Ample turning clearance for the front wheels was obtained by making the fenders extra wide.



Instrument panel is chrome plated. The builder had the rimless windshield cut to his design.



Valves make things easier for driver. Clutch and transmission are hydraulically controlled.

per gallon, and has driven the car at 55 m.p.h. while still far from wide open.

A foreman in a tool and die shop, Walker cuts, bends, and welds husky steel channel as casually as a carpenter saws and nails two-by-fours. Starting with a frame and wheels from a junked 1935 Plymouth, he widened the frame 20", lowered it 6", and installed a body frame cut and bent from steel tubing salvaged from two wrecked planes. The wide seat takes four.

Shaped by hand, the sheet-steel body looks as good as anything you might get from a factory. This is all the more remarkable since the body was the first major sheet-metal job the mechanic-builder had ever tackled. There was one false start. Finding he couldn't turn out a really fine job with steel of the same gauge used in commercial bodies, he scrapped what he'd done and used a slightly heavier gauge.

Selector-valve controls on the instrument

panel help the driver operate the car. Both the clutch and transmission are operated by hydraulic cylinders that Walker made by reaming out gas pipe. Under the hood, in addition to the spare tires, there's the hydraulic system and a vacuum booster diaphragm. The latter holds down the clutch while the car is waiting for a light to change.

Under-car ducting was installed at first to feed cooling air to the engine, but this didn't supply air in sufficient volume. The low clearance prevented use of an under-car metal air scoop, but that didn't stop Walker. He cooked up a spring-supported canvas panel that feeds all the air that's needed and isn't damaged if the car bottoms on a rutted road.

In addition to the usual three-forward and one-reverse transmission, the Walker Special has a two-speed rear axle with a manual shift. This gives a total of six speeds forward and two in reverse.

END

Mechanics and Handicraft

REG. U. S. PAT. OFF.

Repairing Old Pianos

PAGE 228

Tiny Train Has Ratchet Drive

PAGE 190

Working Model Hot-Air Engine

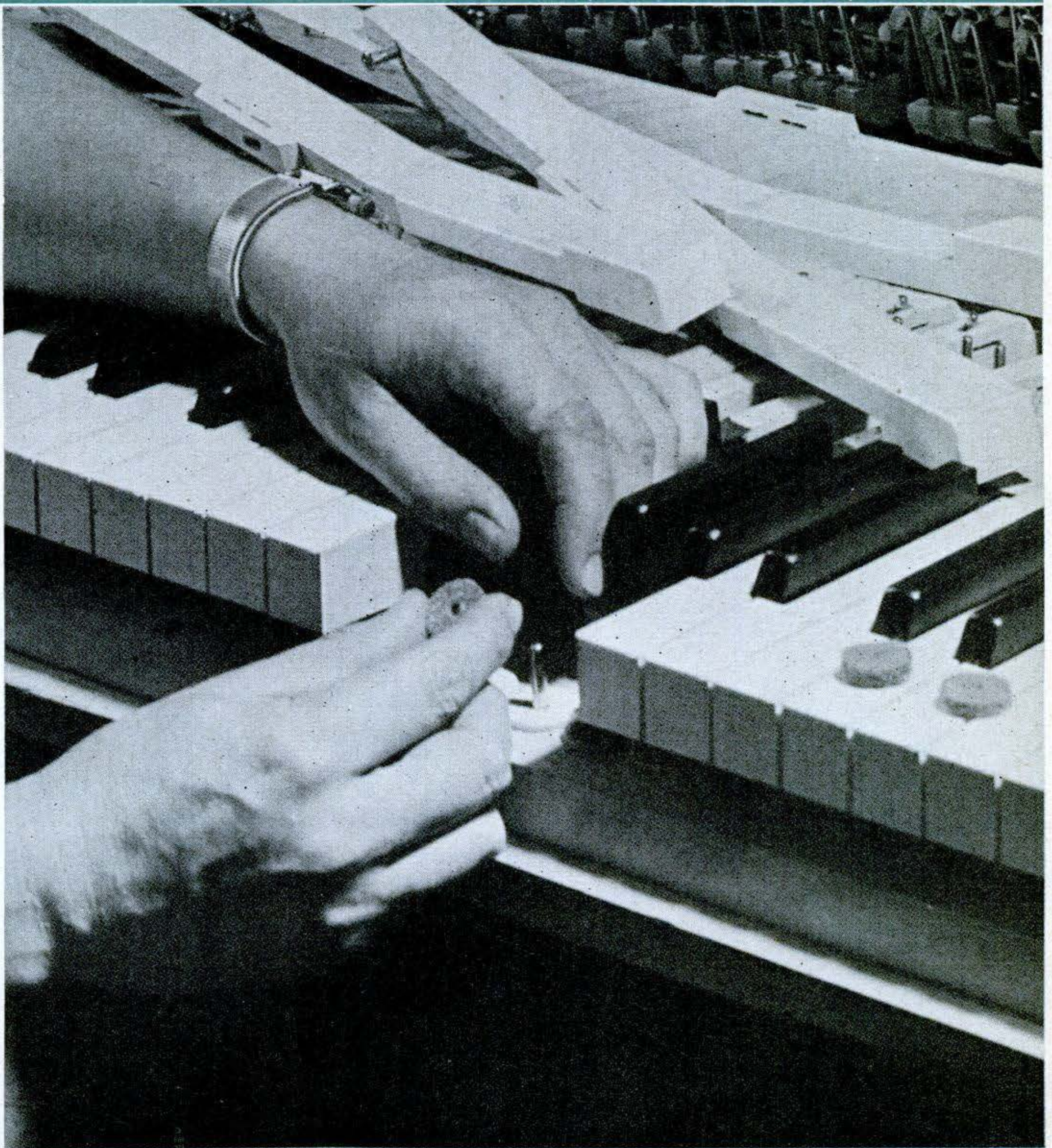
PAGE 194

How to Take Pictures of Glass

PAGE 216

Wireless Mike Sends to Radio

PAGE 224



Leveling keys with felt punchings is among the piano repairs you can do. Page 228^c



6000 Plastic Box Framed in Copper



Better make several of these copper-cornered boxes. You'll want one yourself, and extras will fill those gaps in your Christmas list.

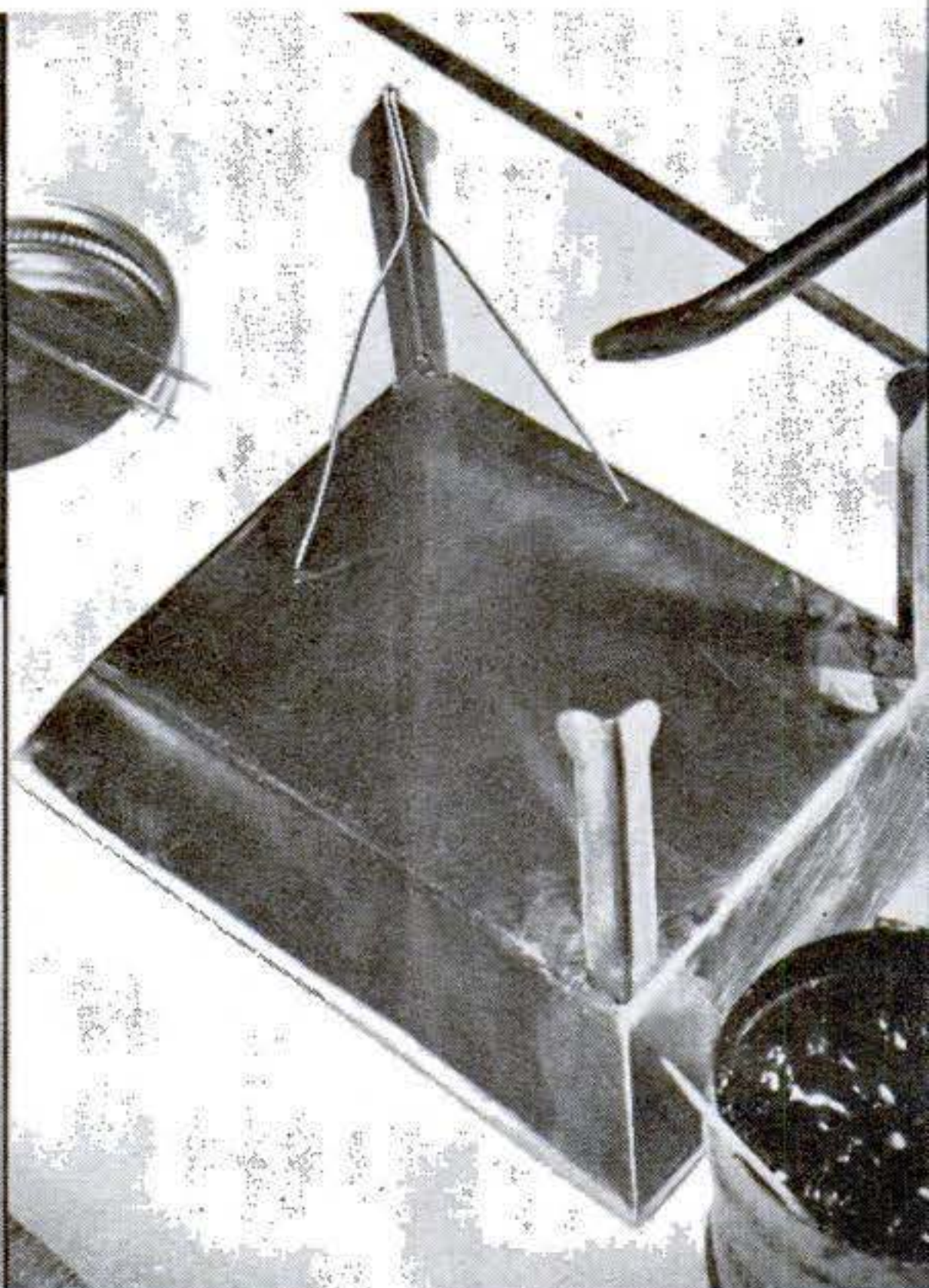
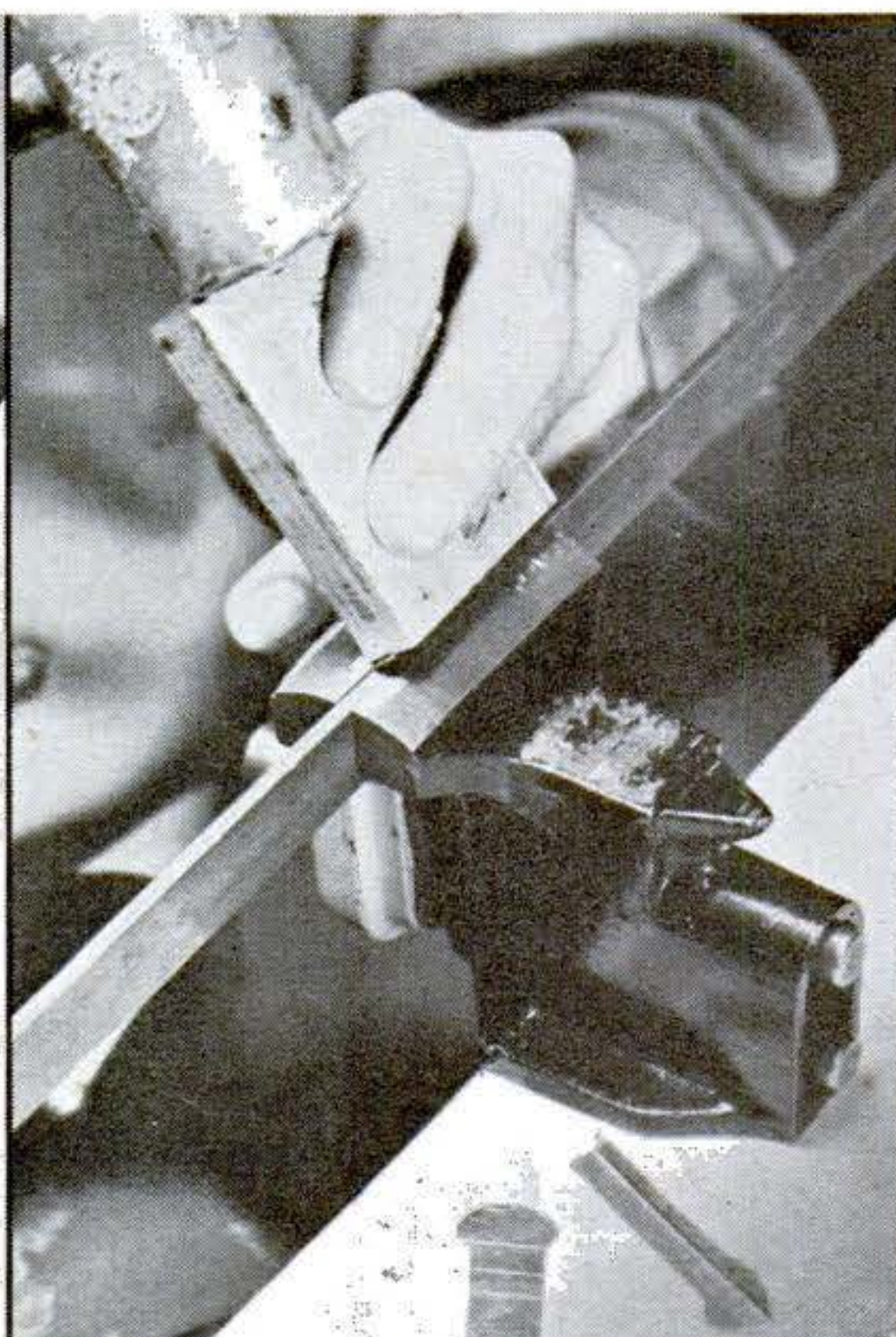
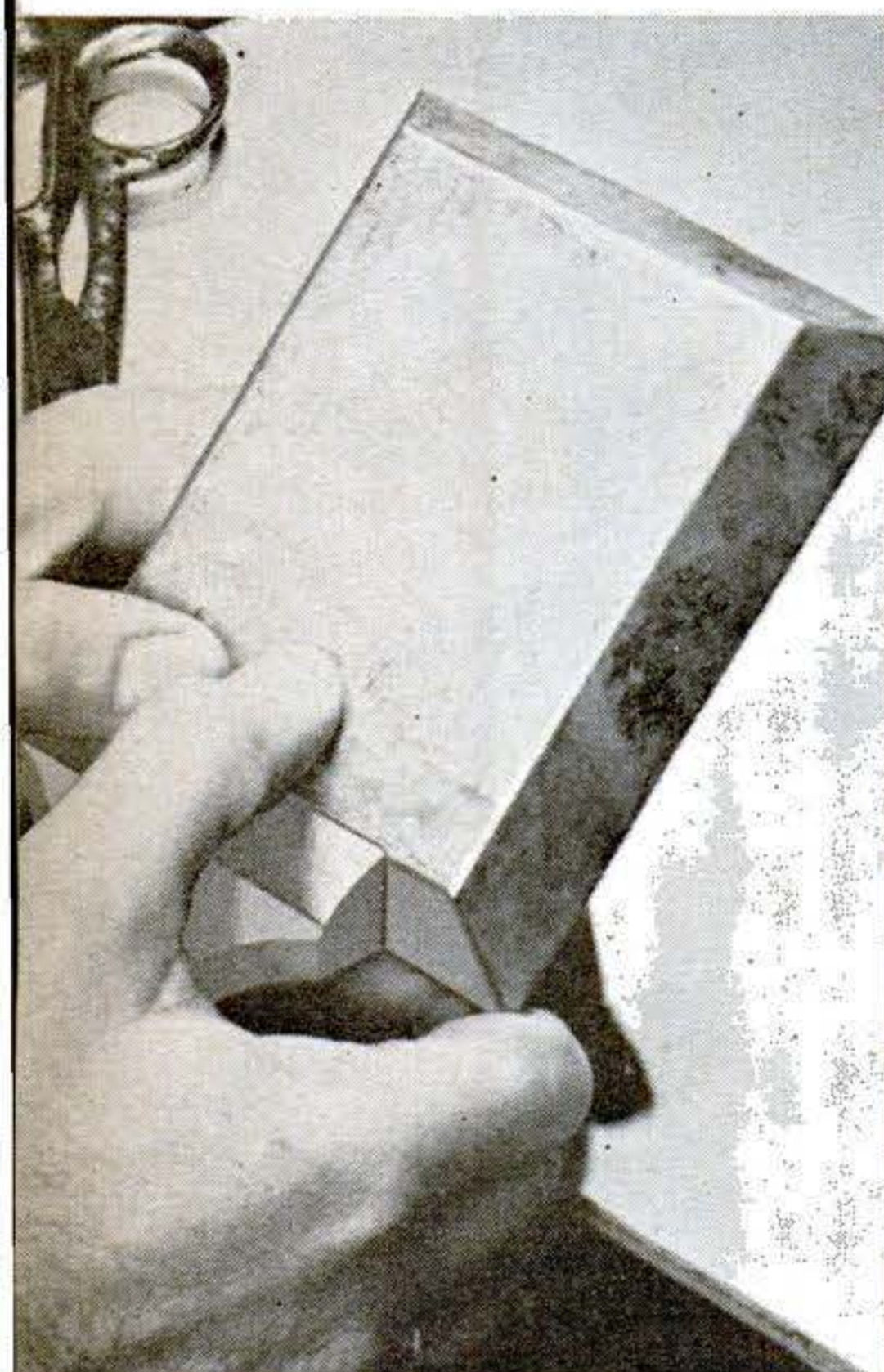
Two popular craftwork materials are neatly blended in this attractive candy or cigarette server.

By Bill Luther

GLISTENING copper and transparent colored plastic combine their lusters in this cleanly styled cigarette box. It will hold either regular or king-size smokes, or serve as a candy or jewelry box.

The base, frame members, and floral escutcheon on top are made from 18- or 20-gauge soft copper. In laying out and cutting the copper, be sure to get the outlines, corners, and bend lines accurate. Smooth the cut edges with a file, flatten the blanks on a metal plate, and anneal them by heating red hot. Quench in a weak pickling solution of sulphuric or nitric acid and water. This removes scale and dirt.

Bend the metal to shape in a vise and solder the joints and seams on the inside. Buff the copper thoroughly with tripoli, finishing with jeweler's rouge.



Clamp the base in a vise, as at left, and make the stiffening and 45-deg. corner bends. Corner posts are hammered over along the centerline. Back them in the vise with a square-edged bar

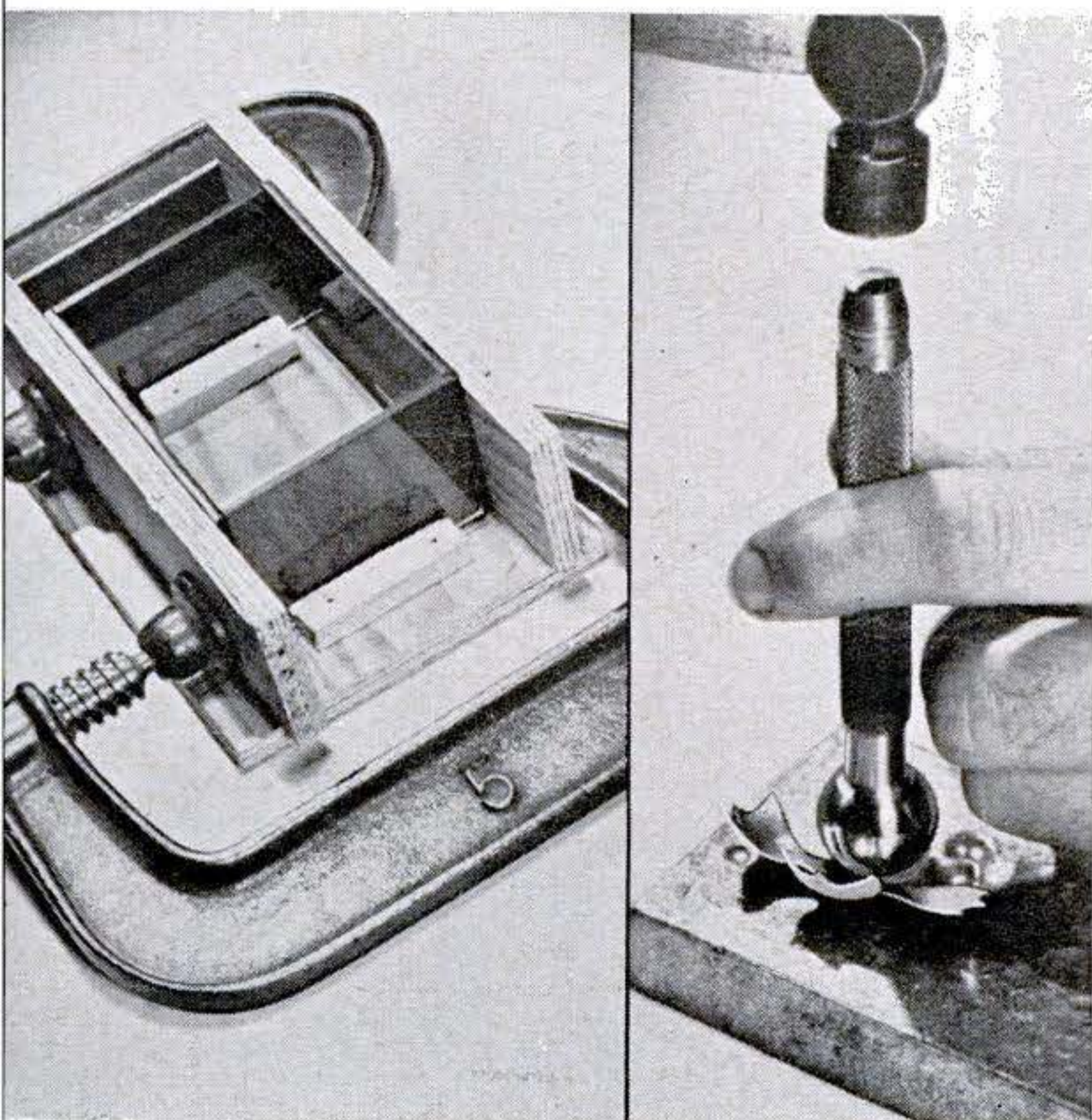
(center) and use a smooth block between the work and the mallet. A wire holding jig will help in soldering the posts to the base. Put a chip of solder at the corner and flow it in.

The box itself is constructed of $\frac{1}{8}$ " plastic. Two 2" by 4" pieces are needed for the sides and two 2" by 3" for the ends. A single $3\frac{1}{4}$ " by 4" rectangle is required for the top. Saw the plastic just a bit over these dimensions. Lay a file on the bench and "joint" the plastic edges true and square by rubbing firmly against the file. Repeat the operation with fine sandpaper.

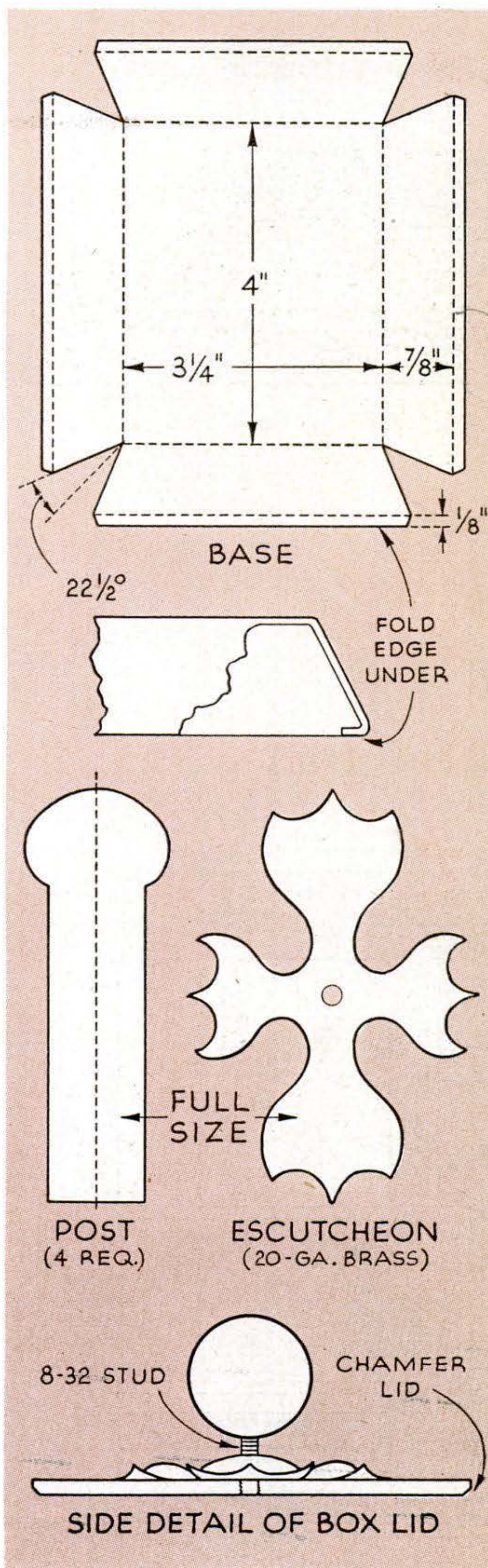
A wooden jig will simplify the assembly of the plastic pieces. Apply plastic cement, butt the longer pieces outside the shorter ones, and clamp them solidly until they dry. When the cement has set, round off the lower corners to clear the solder at the bottom of the corner posts. Sand all plastic edges with fine-grit paper and buff them until they become transparent.

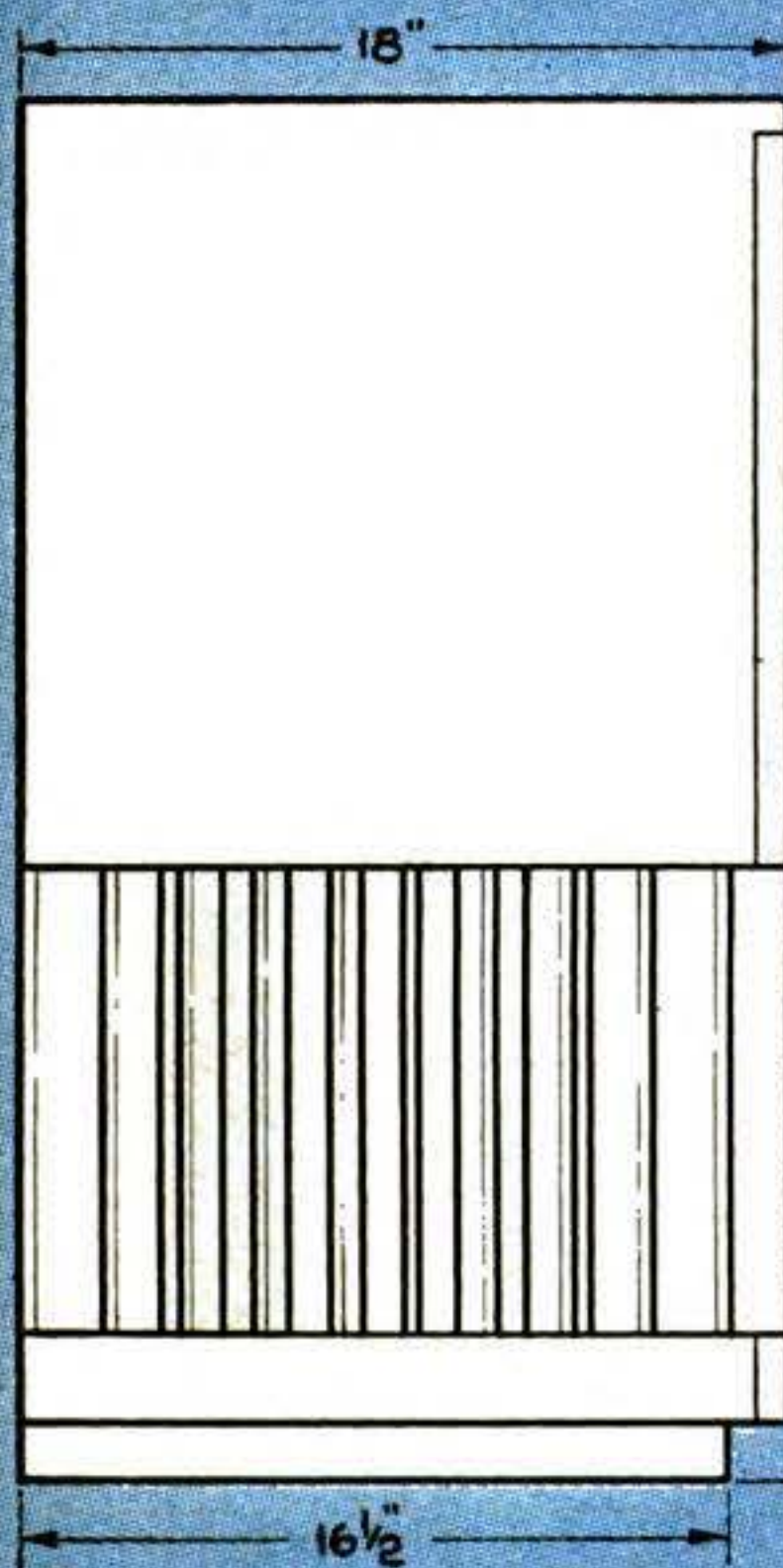
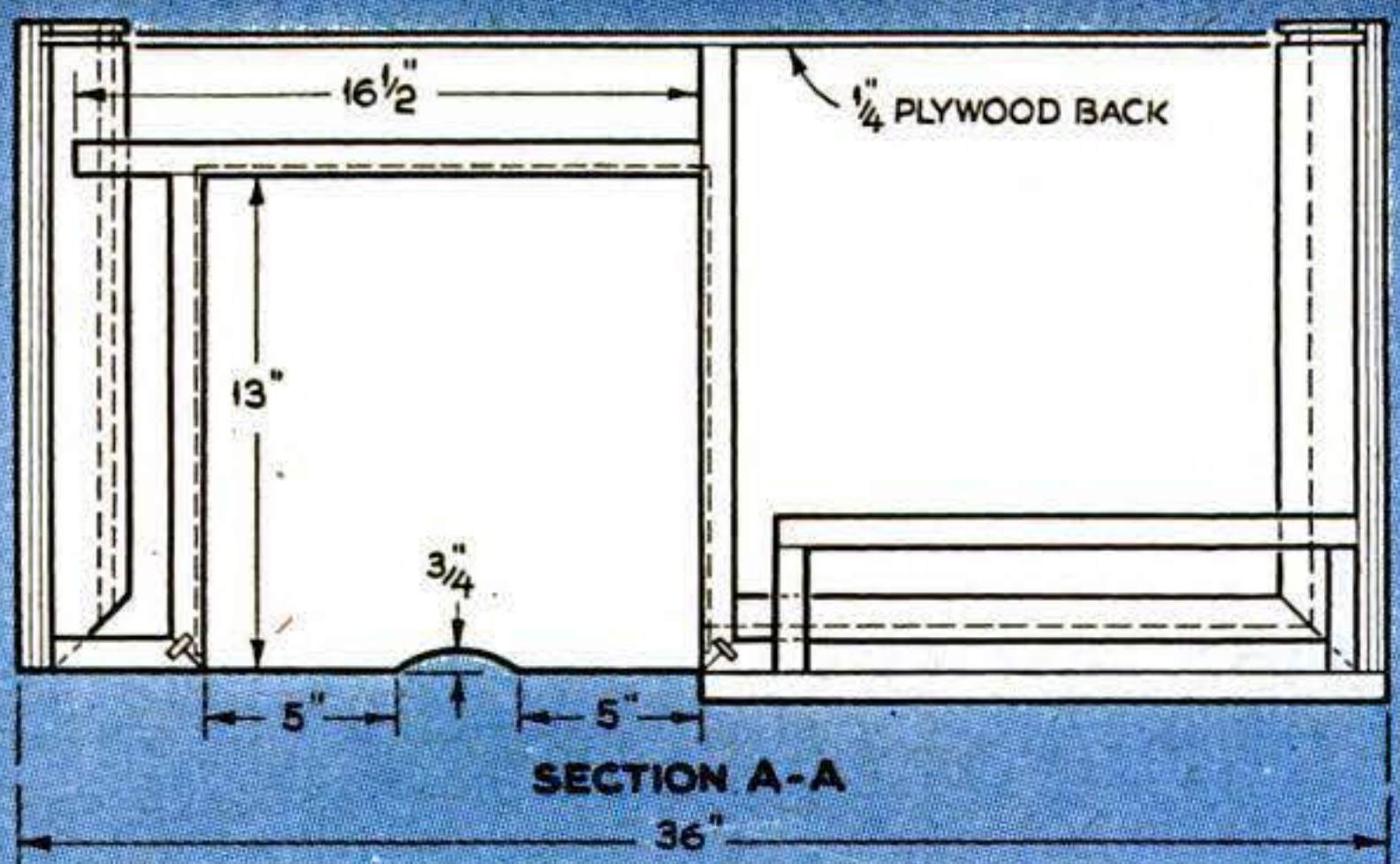
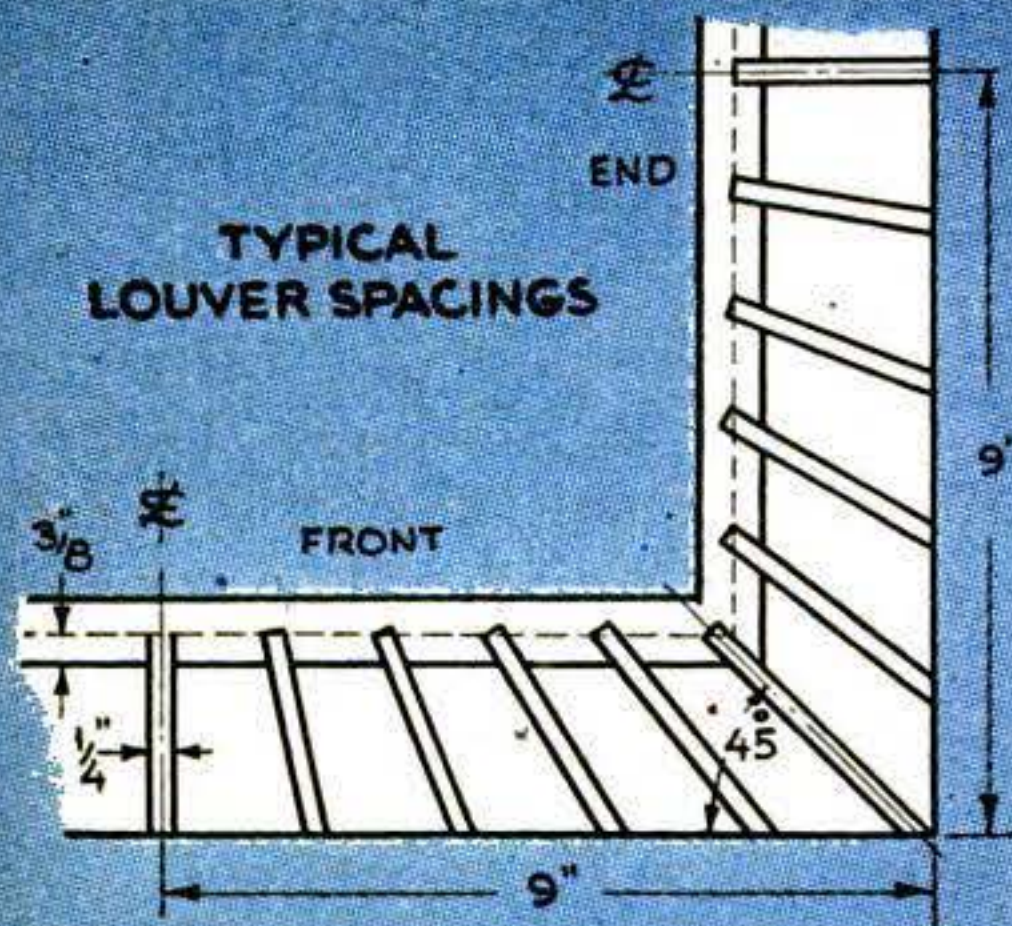
A $\frac{7}{8}$ " copper ball that turned up in the junk box became the lid handle, but almost any similar object could be used here with good effect. Thread a stud into the ball, drill through the escutcheon and lid, and thread the hole in the latter to suit the stud.

Chamfer the underside of the lid so that it will seat easily within the flared corners of the posts; then remove the box and burnish all the metal parts. Apply a coat of clear lacquer to retard tarnishing. A dab of cement along the lower edges of the plastic will keep it firmly in place. **END**

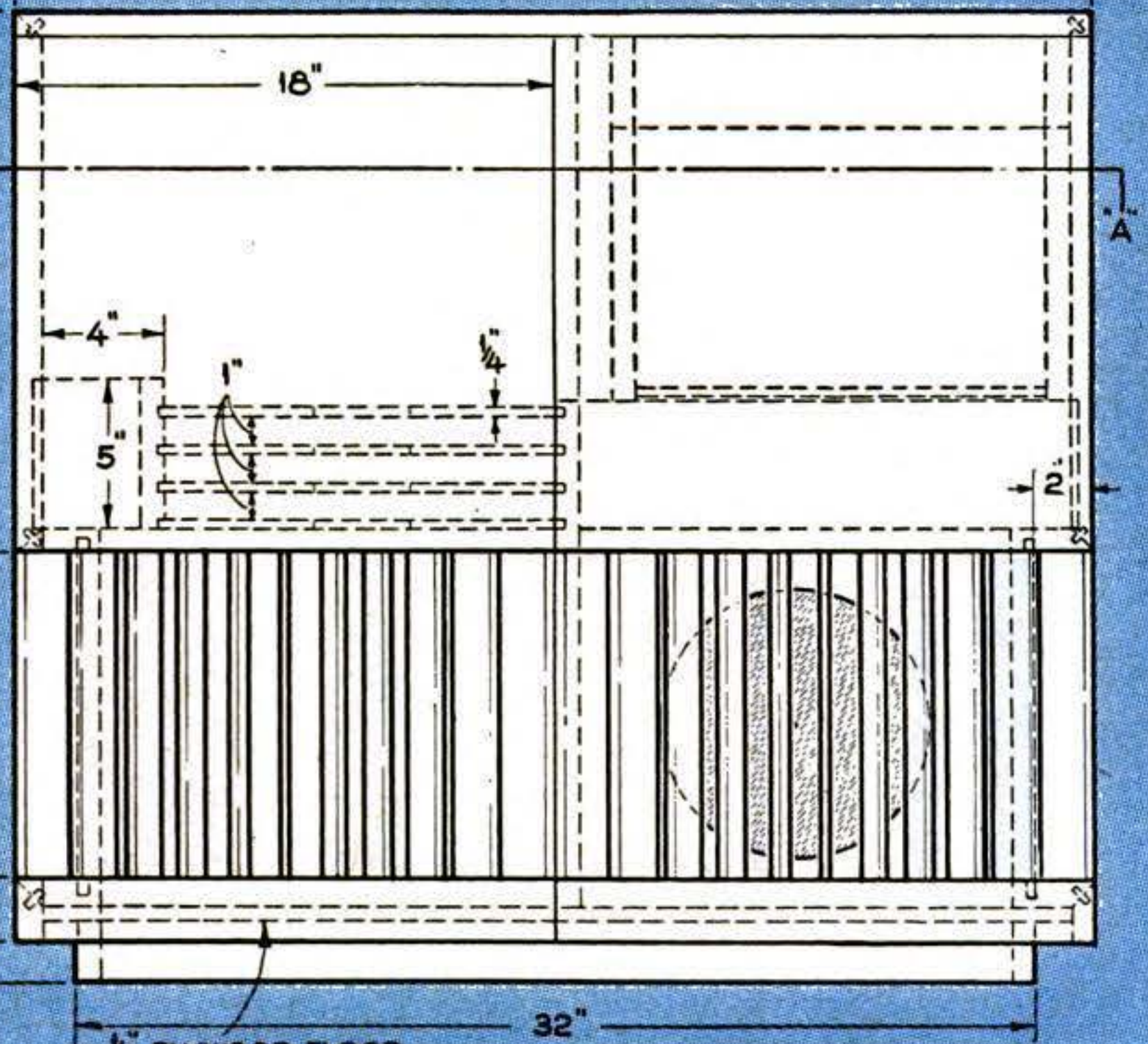


An assembly jig, left, is good for cementing the plastic sides and ends. The escutcheon is given its raised effect by hammering with a ball-ended punch over a lead block.

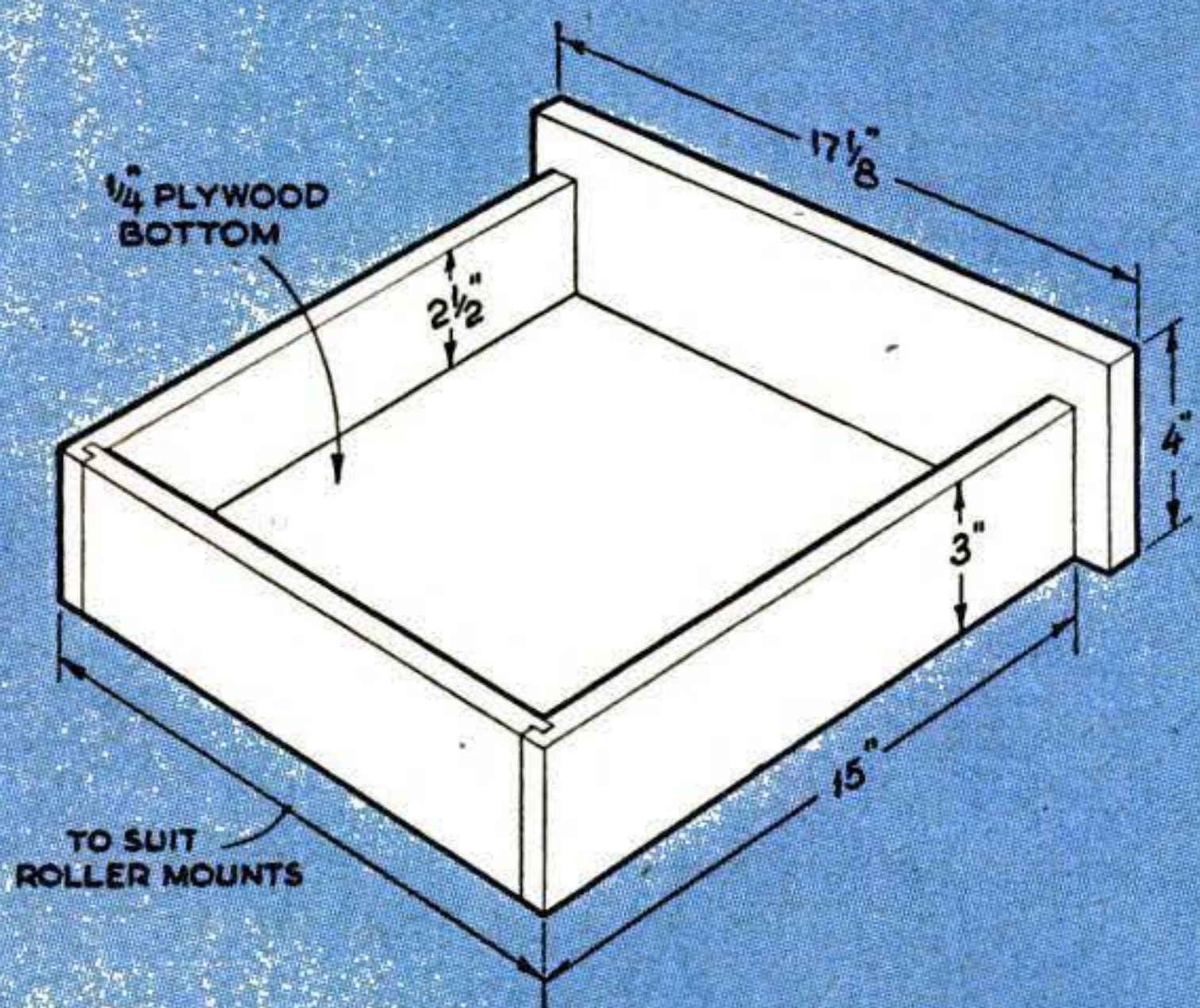
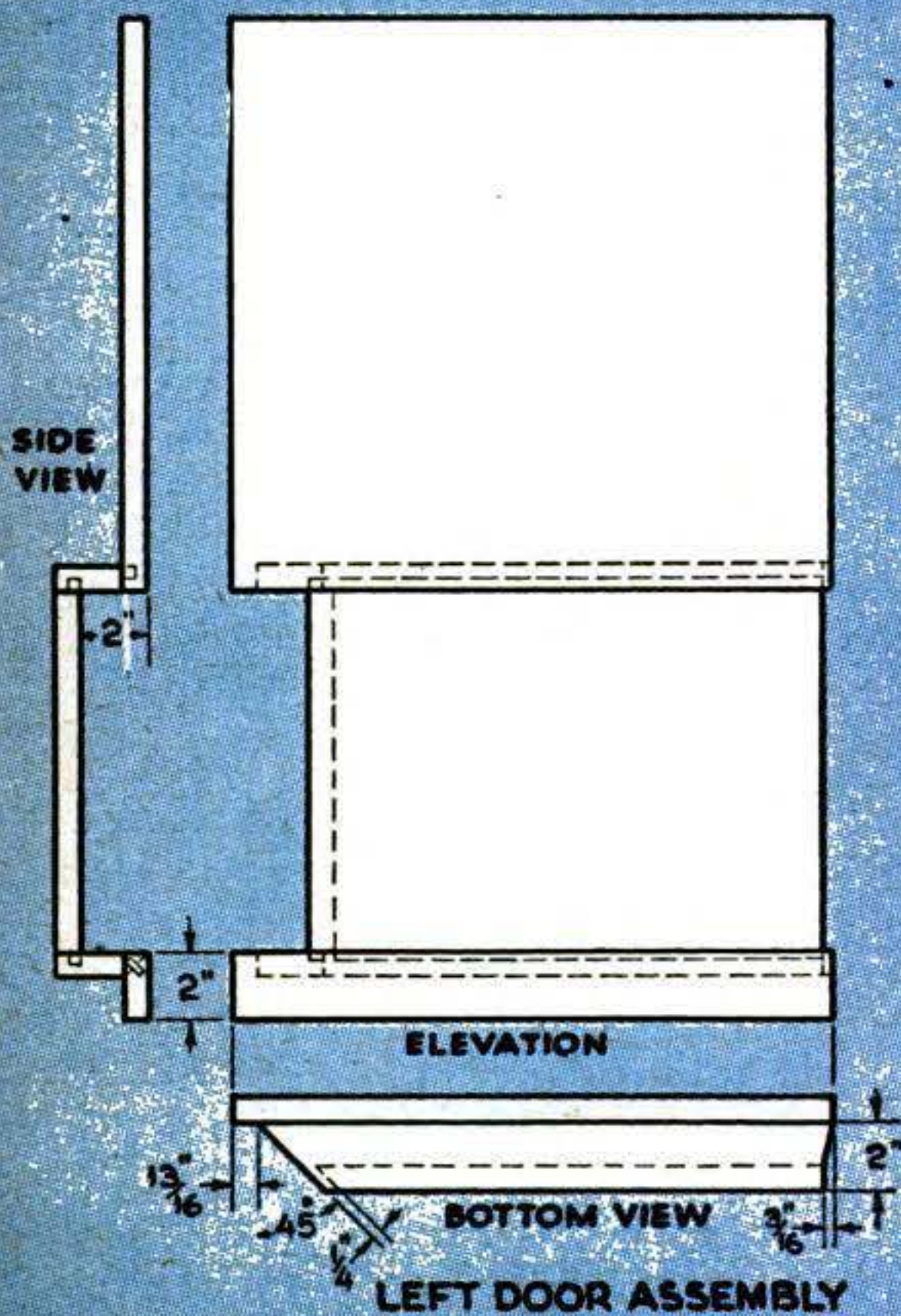




SIDE ELEVATION



FRONT ELEVATION



RECORD PLAYER ROLL-OUT DRAWER

Modern Radio-Phono Cabinet

Built Around Old Set

By Bernard I. Bell

THERE are many reasons for assembling your radio phonograph from separate units, and all of them spell value. Low-priced tuners, record changers, amplifiers, and speakers often surpass in quality the comparable parts of upper-bracket combination consoles. In addition, you may be able to salvage one or more of the four parts from equipment you already have.

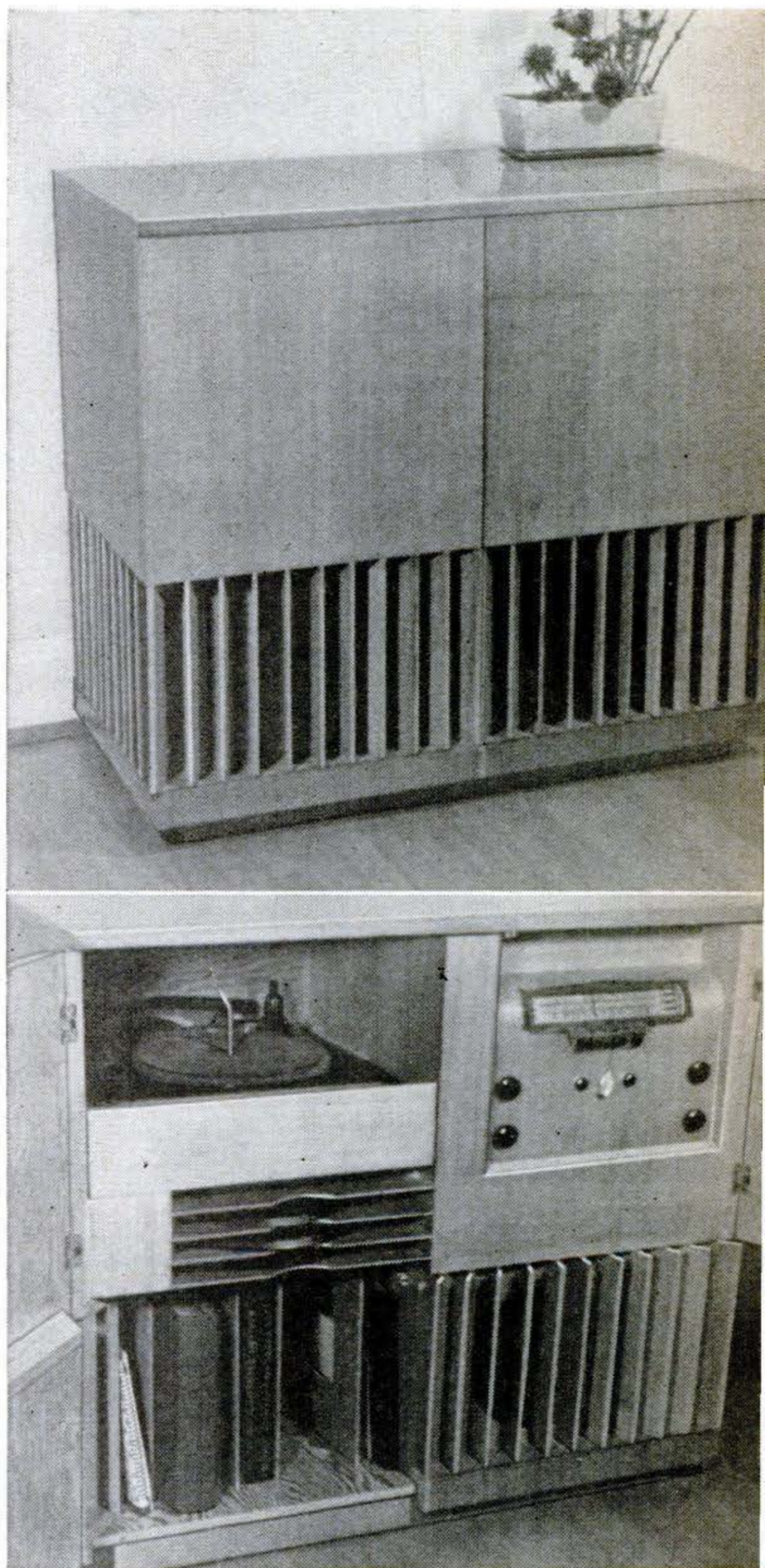
Perhaps your problems can be solved by just adding an automatic record player to an otherwise good radio; maybe it's FM that you want in your new setup, or a new loudspeaker to banish the old, tinny sound. Whatever you have to start with, and whatever you want to add, you can save yourself a pretty penny by doing the job yourself.

The photos and drawings on these pages show how I modernized my odds and ends of radio apparatus into an integrated combination. The record-player drawer is mounted on commercial ball-bearing slides, while the radio and its front panel were taken from an old set and fitted into the new cabinet. Both radio and player are connected to a double-pole, double-throw switch by plugs.

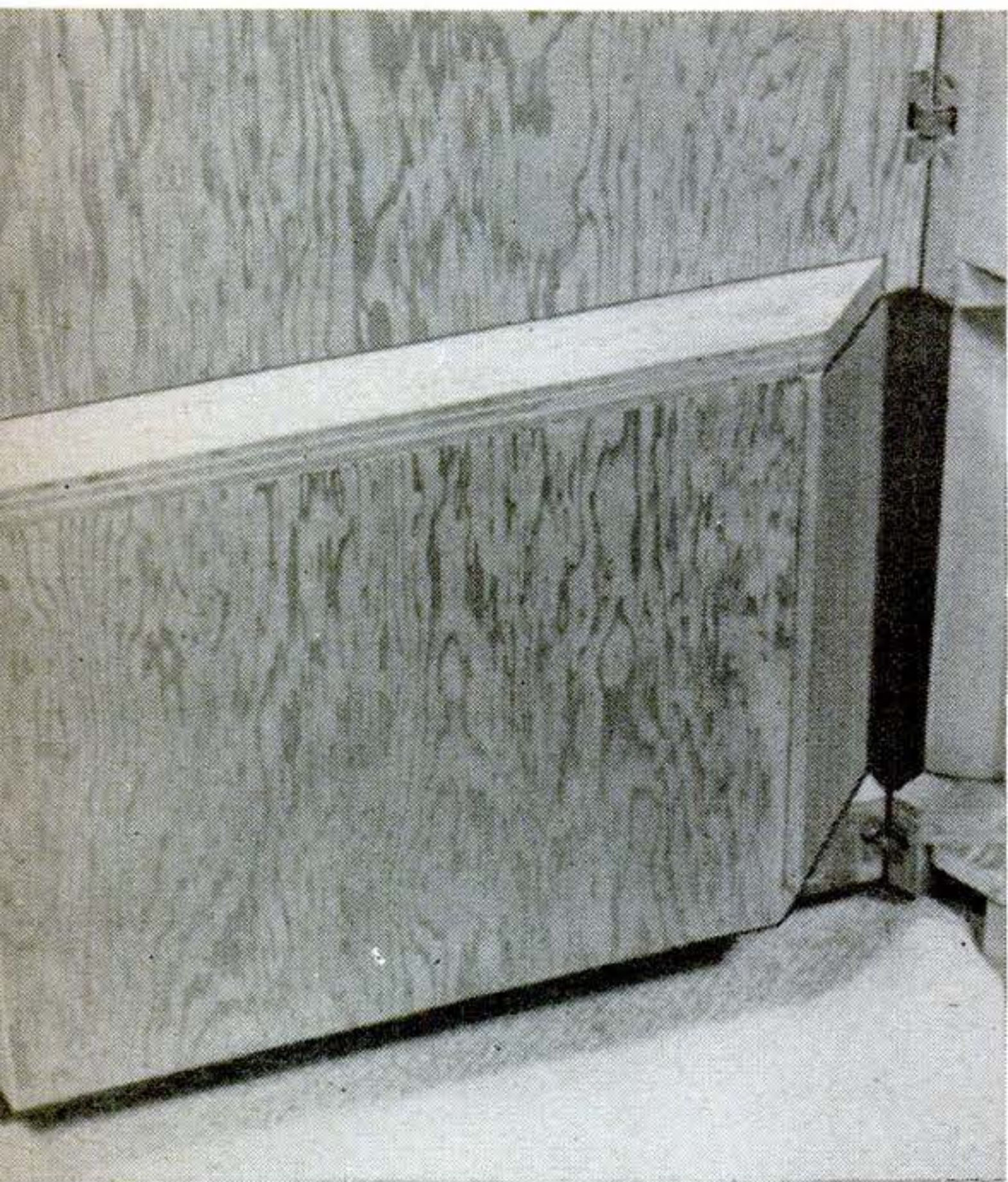
The cabinet was built of 13/16" plywood with mahogany veneer on one side. The louvers, record shelves, and partitions are 1/4" solid mahogany. All exposed plywood edges—such as the front edge at the top of the cabinet—were concealed with mahogany veneer. Mitered spline joints were used wherever possible to reduce the amount of edge veneering.

Grooves for the back edges of the louvers are cut at angles in the vertical pieces of the louver housing, not in the horizontal parts. After the louvers were cut and fitted into their grooves, they were marked on both sides. Then the portions to be glued were masked during finishing operations.

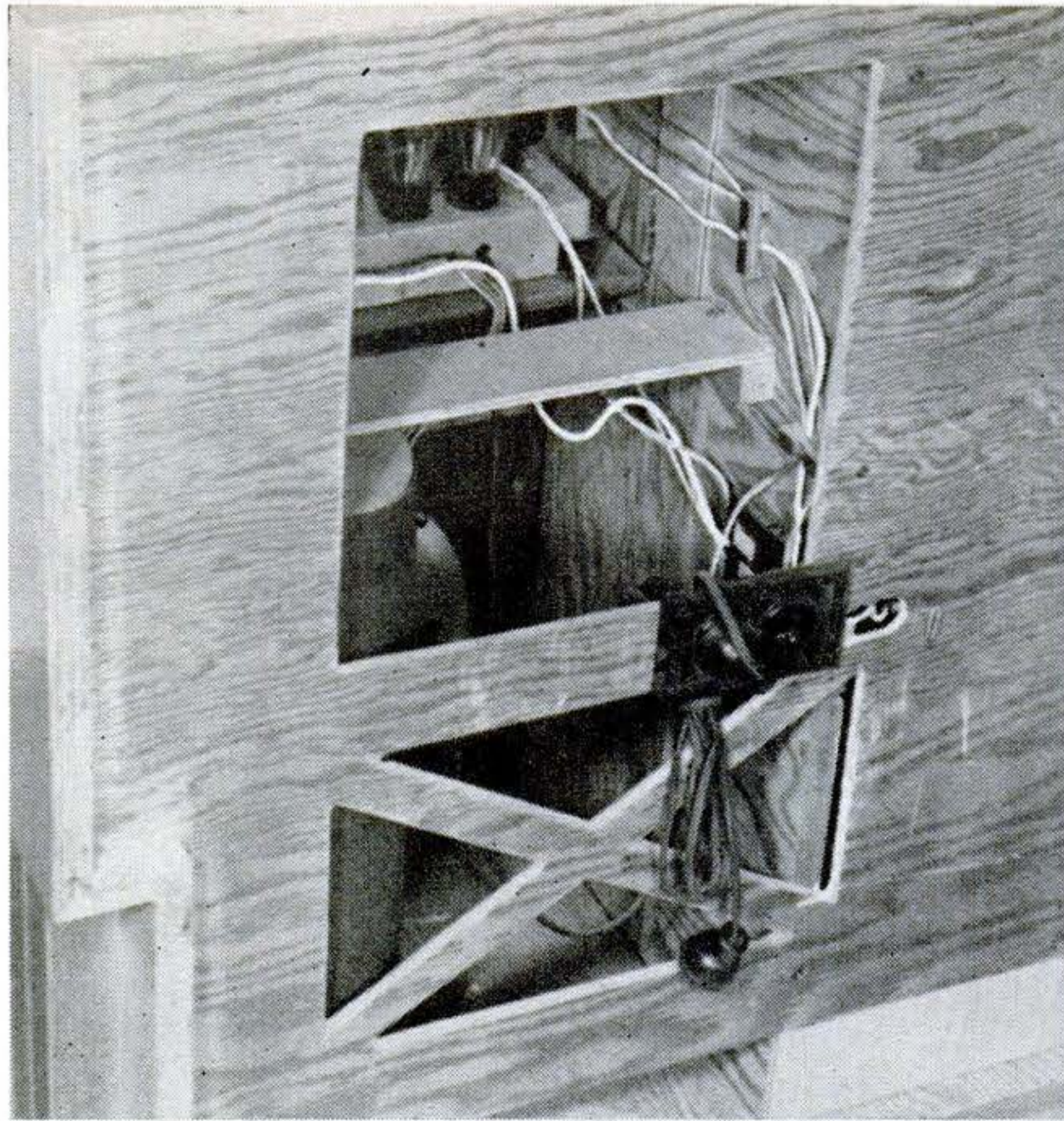
When the cabinet was completed, except



As the cabinet was assembled, the necessary supports for the radio chassis were fitted in. The speaker is mounted beneath the radio and behind an opening in the louvered panel at right.



This is the bottom of the door enclosing the record-player side of the cabinet. The corner louver swings with this door.



With both units connected to the switch by plugs, either one can be removed from the cabinet without disturbing the other or the switch.

for fitting the louver boards, it was given a lacquer finish. During this operation, the louver grooves were filled with scrap lumber to keep them clean and ready for glue.

I first applied a commercial wood bleach and then a quick-drying paste wood filler of natural color. A coat of lacquer sanding

sealer was sprayed on, and when dry, sanded lightly and dusted thoroughly. Next, several coats of semigloss clear lacquer were sprayed on with wet sanding between coats. The final coat was rubbed with pumice and oil to a glasslike finish. Lastly, a coat of furniture wax was applied. **END**

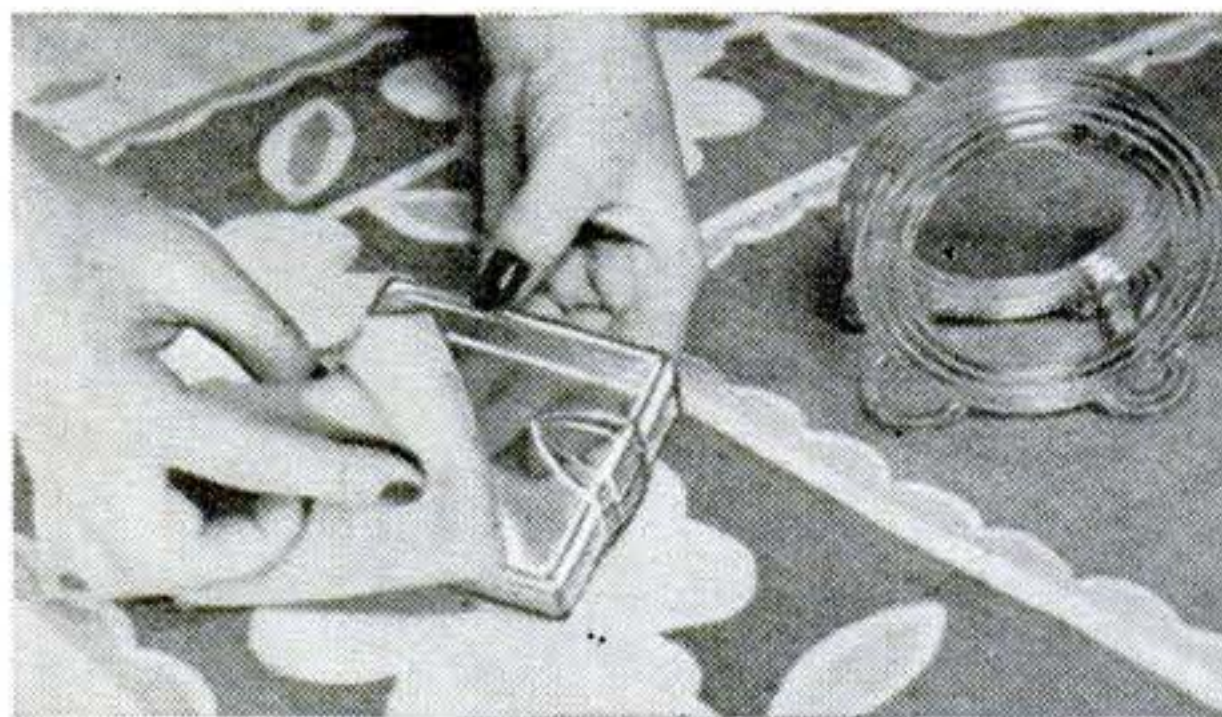
CARING FOR PLASTICS 6272 [SHIP SHAPE HOME]

SINCE the surface of articles made of Lucite® and Plexiglas® is relatively soft, no abrasive cleaners should be used on them. Lukewarm water and soap will clean these plastics. Excessive heat is harmful, so do not expose them to flame or use boiling water on them.

First rinse the article to be cleaned with water. Then sponge it with soap and water, and again rinse it with clean water. Use only a cloth or sponge that is free of grit or dirt. After washing, wipe the article with a clean, slightly damp chamois, a pad of absorbent cotton, or a clean flannel cloth.

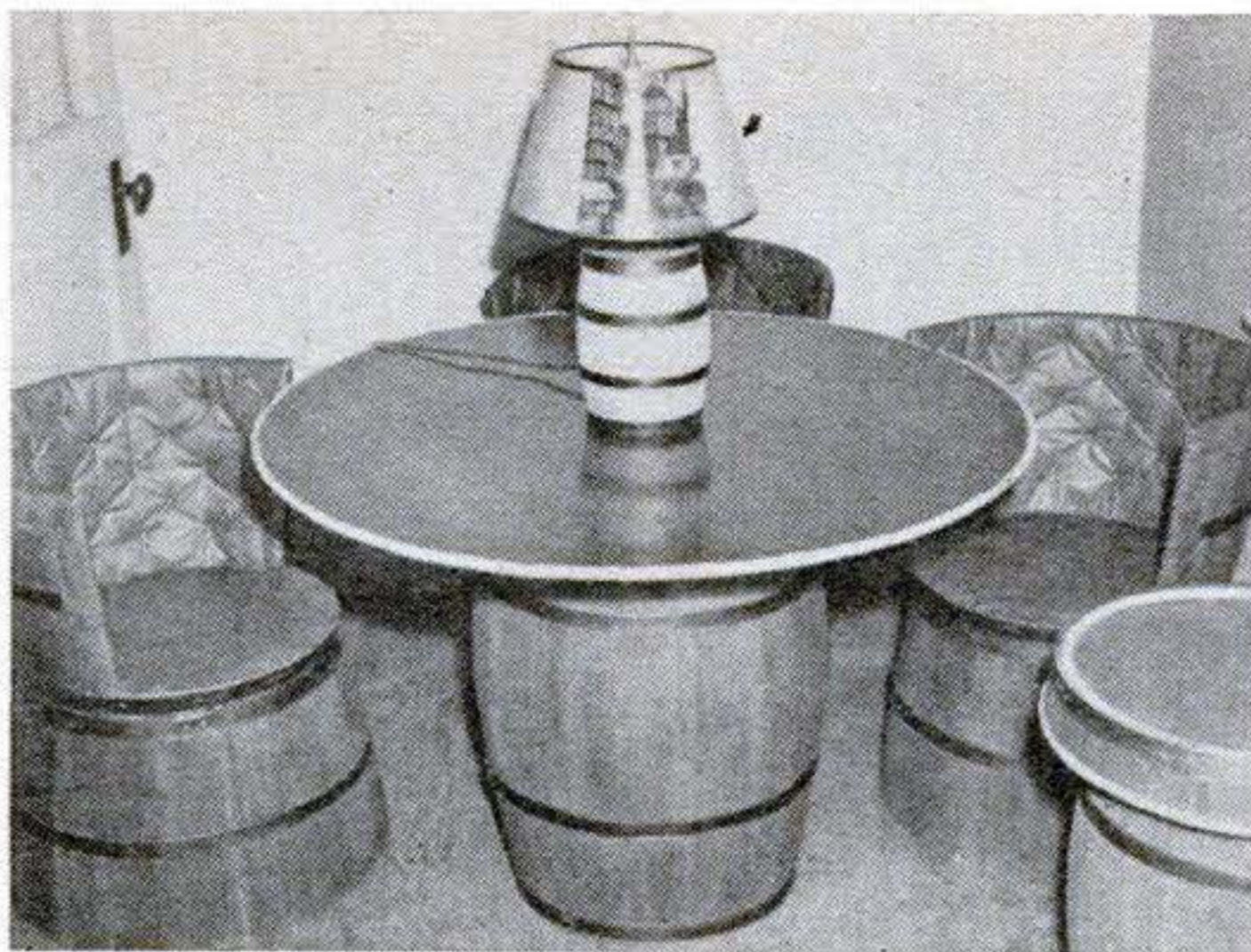
Avoid use of window cleaners, benzene, denatured alcohol, and household cleansers, since these contain solvents or abrasives harmful to plastic. Also avoid spot removers and nail-polish removers. These usually contain solvents that may attack plastic.

Finally, to bring out the sparkle in plastics, apply paste wax and polish gently with a clean cloth. Do not rub too hard because this creates a charge of static electricity on the article that attracts dust. This can be avoided by using a special wax that prevents the formation of static electricity.



POPULAR SCIENCE MONTHLY SHOP DATA

1413



Artificial-leather upholstery, a hardwood table top, and an oak-cask lamp form this ensemble.



Spraying stain on a barrel chair. Clean, well-seasoned hardwood staves get a natural finish.

Furniture Maker Uses Barrels

THE general store may lose some of its popularity when confirmed barrel-sitters discover they can have the same masculine furniture right in their own homes. These models, made by the Bob Company, St. Joseph, Mo., are even more comfortable, for they've been given backs, arm rests, and upholstery.

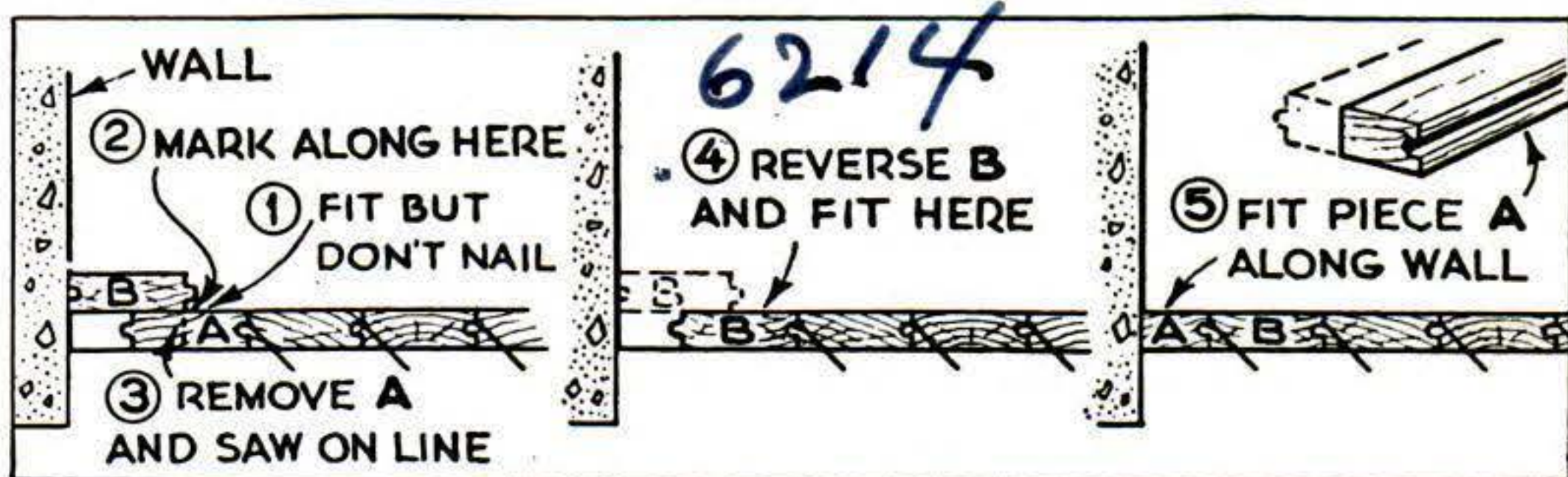
Barrels are particularly suited for chairs, ottomans, tables and the like. Even within the fixed barrel shape there is plenty of opportunity for variation in style. Note, for example, the armchair being spray-finished in the upper right-hand photo. Arm and back space has simply been cut out of the upper half, leaving the original barrel contour. The flare-armed chair behind the operator, on the other hand, was made by sawing the barrel in half and putting the bottom on top.



Tacking a layer of padding in a barrel seat. Upholstering is the hardest portion of the job.

Plank Cut to Size Fits Floor Flush from Wall to Wall

AN EASY way to fit floor planks from wall to wall is illustrated in the three sketches at the right. The last full-size plank (A) is put in place but not nailed. Lay another plank above it with the grooved end flush with the wall and mark off the excess width on A. Turn over and fit in the marking piece, B, and rip the marked plank to the line. The tongued part



is the waste. The grooved part should then fit flush with the wall, giving a clean, professional appearance.—Richard G. Brophy, Santa Fe, N. Mex.

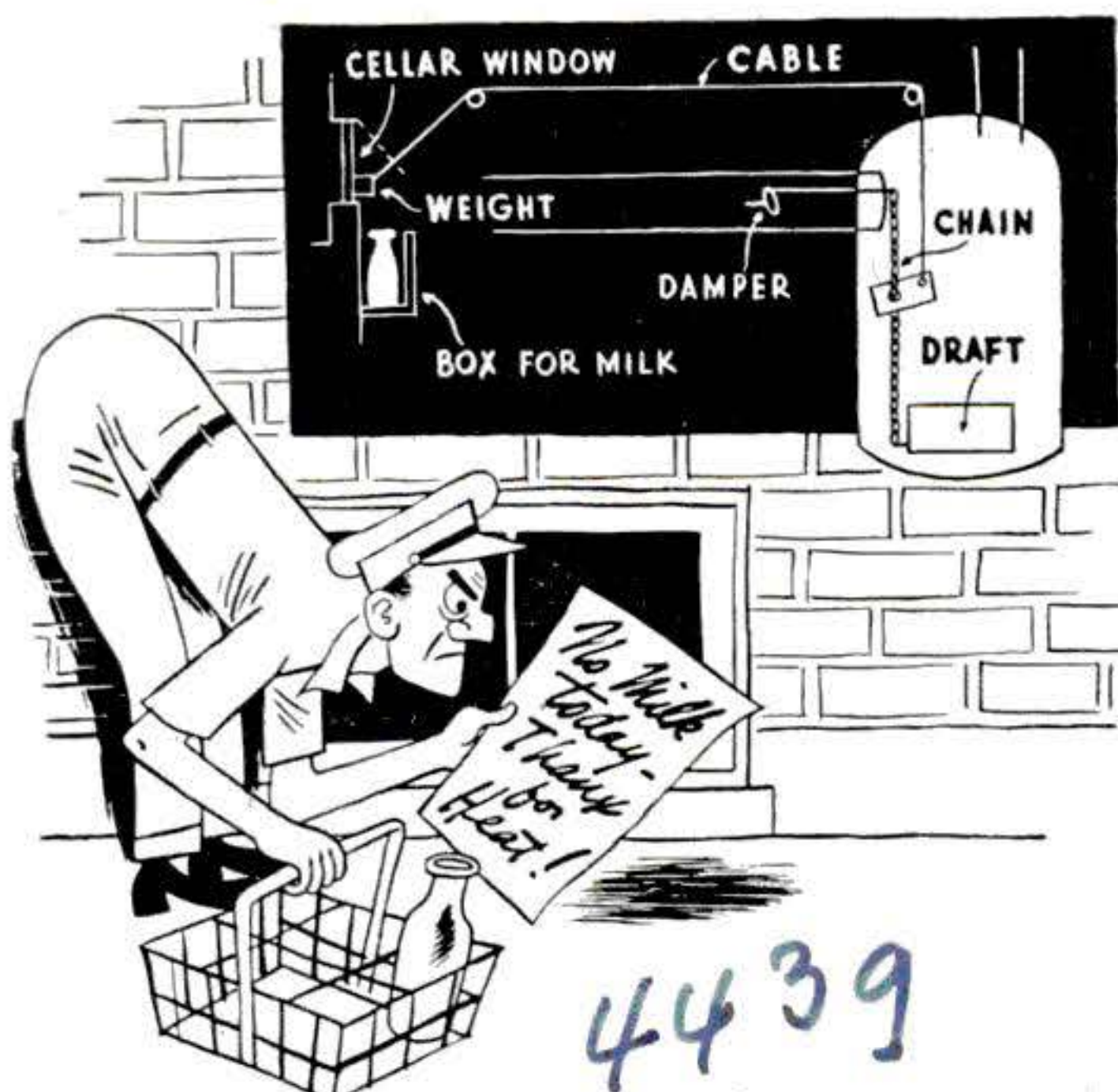
What's Your Ingenuity Quotient?



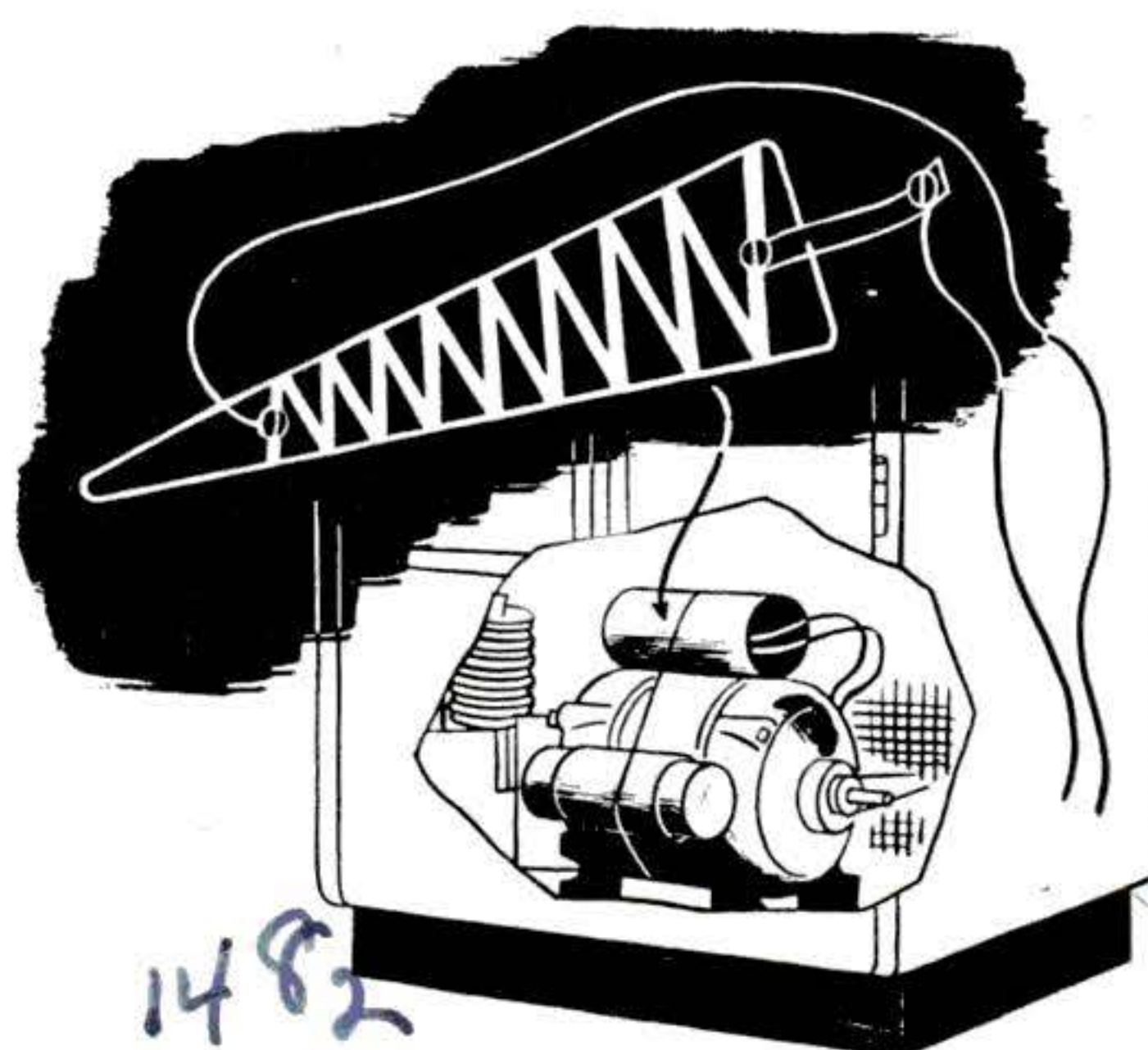
"Don't gum up the works," my wife warned when I set out to seal the bottom holes of some highly glazed flower pots. But that's just what I did. After unsuccessfully trying various sealers, I found that well-chewed bubble gum stuck tightly to the smooth surface. The children did the chewing.—*H. W. Squires, Virginia City, Nev.*



A booby trap was the answer to dogs upsetting our garbage pail. I screwed a mouse trap to the lid, tied one end of a string to the trigger and the other end to the pail, and glued an explosive cap to the trap. Whenever the lid is removed, the cap fires—scaring the dogs away. Forget the whole business if you have a nervous garbage collector.—*Roy Nilson, Fords, N. J.*



Our milkman, besides clanking a lot of bottles together at 5 a.m., also starts our furnace. When he pushes the window open, the cable slackens and a piece of iron runs down the chain. When he closes the window, the iron catches the chain and opens the draft.—*F. A. Robbins, Red Hook, N. Y.*



Here's how I saved the bacon when the starting condenser of our refrigerator motor failed: I wrapped half an electric-iron element in asbestos and connected it as a resistor in place of the condenser. This gave enough phase lead to start the capacitor motor.—*W. R. Percival, Toronto, Ont.*

Have you pulled off a smart one lately? We will pay for acceptable contributions showing ingenious solutions of problems in the home, shop, garage, or camp. It doesn't matter if it's wacky—if it works. Use government postcards only. Contributions cannot be acknowledged or returned.

6163

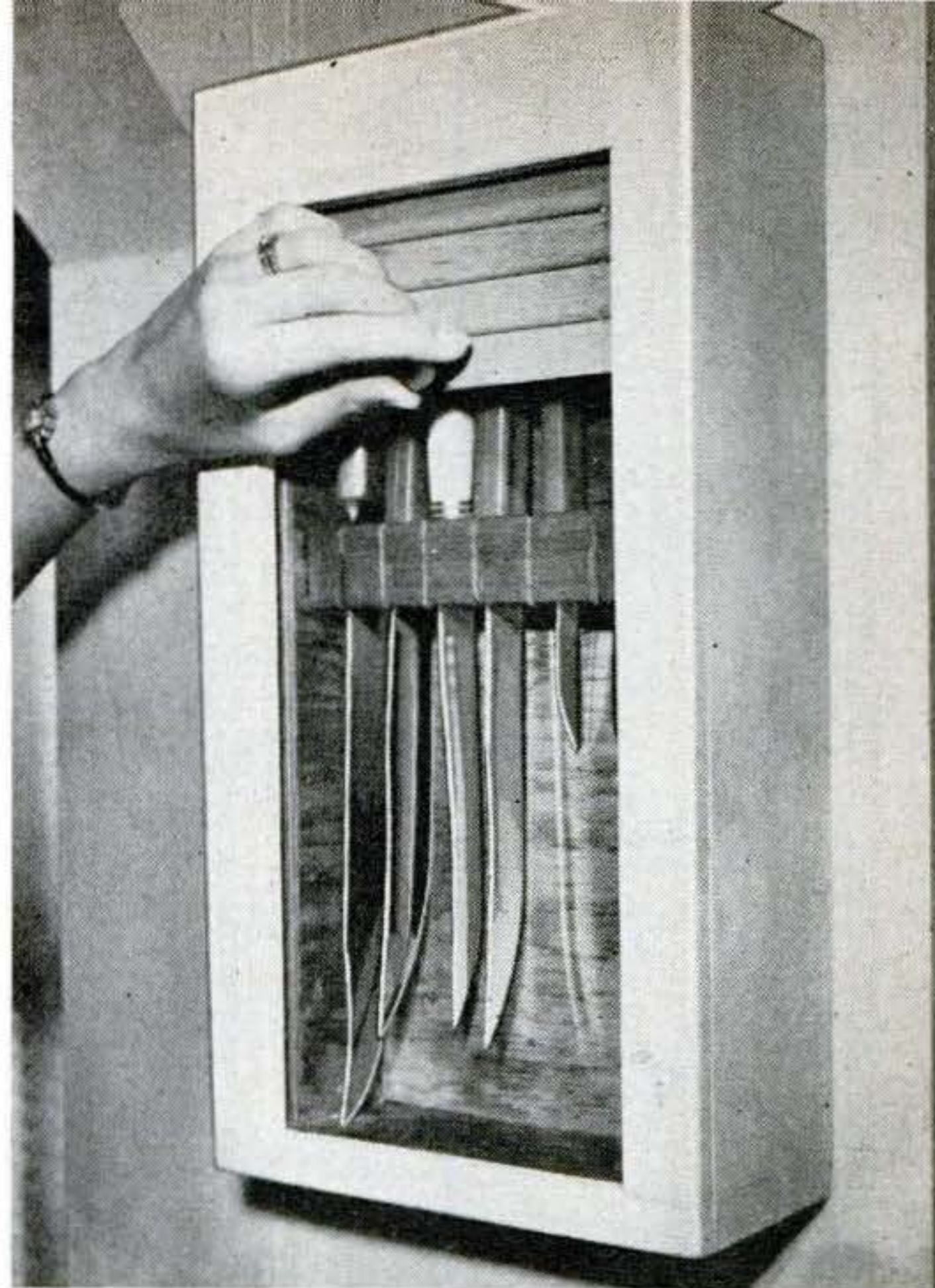
Roll Front Closes Cutlery Cabinet

A SLIDING door made of 22 slats laced together by rubber-covered stranded wire encloses the front of this knife cabinet. All the work can be done with hand tools, although power tools help in sawing and drilling.

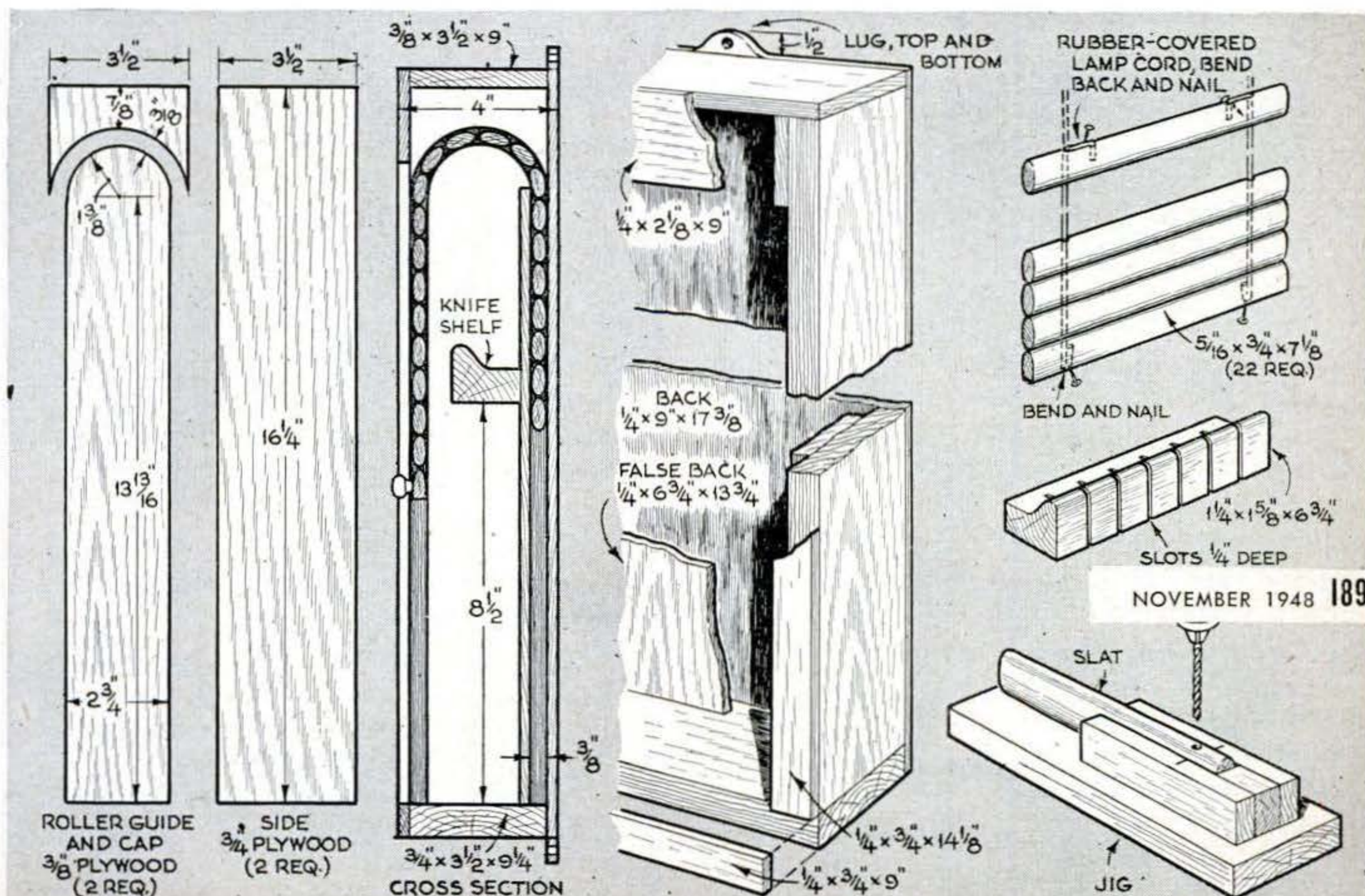
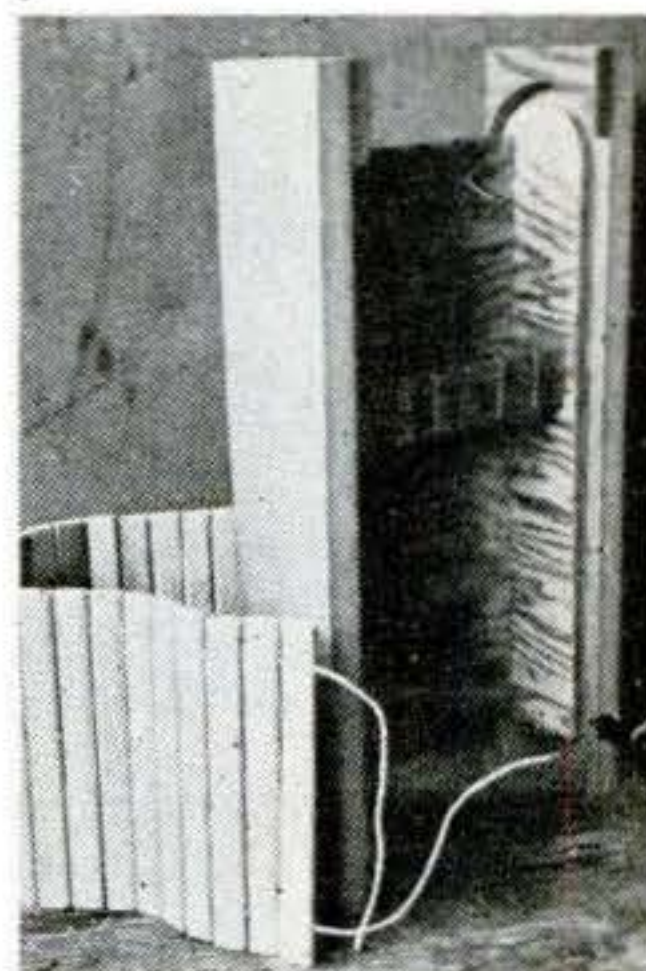
Make the two roller guides and caps first, cutting them from $\frac{3}{8}$ " plywood. Then cut the two sidepieces from $\frac{3}{4}$ " plywood. Next nail and glue the guides to the sides, leaving $\frac{3}{8}$ " on each side for the roll front. Fit the guide caps, as shown, to leave a $\frac{3}{8}$ " channel. Cut the false back next, and then nail and glue the bottom and sides to it. When you saw out the true back, be sure to make the hanging lugs part of it.

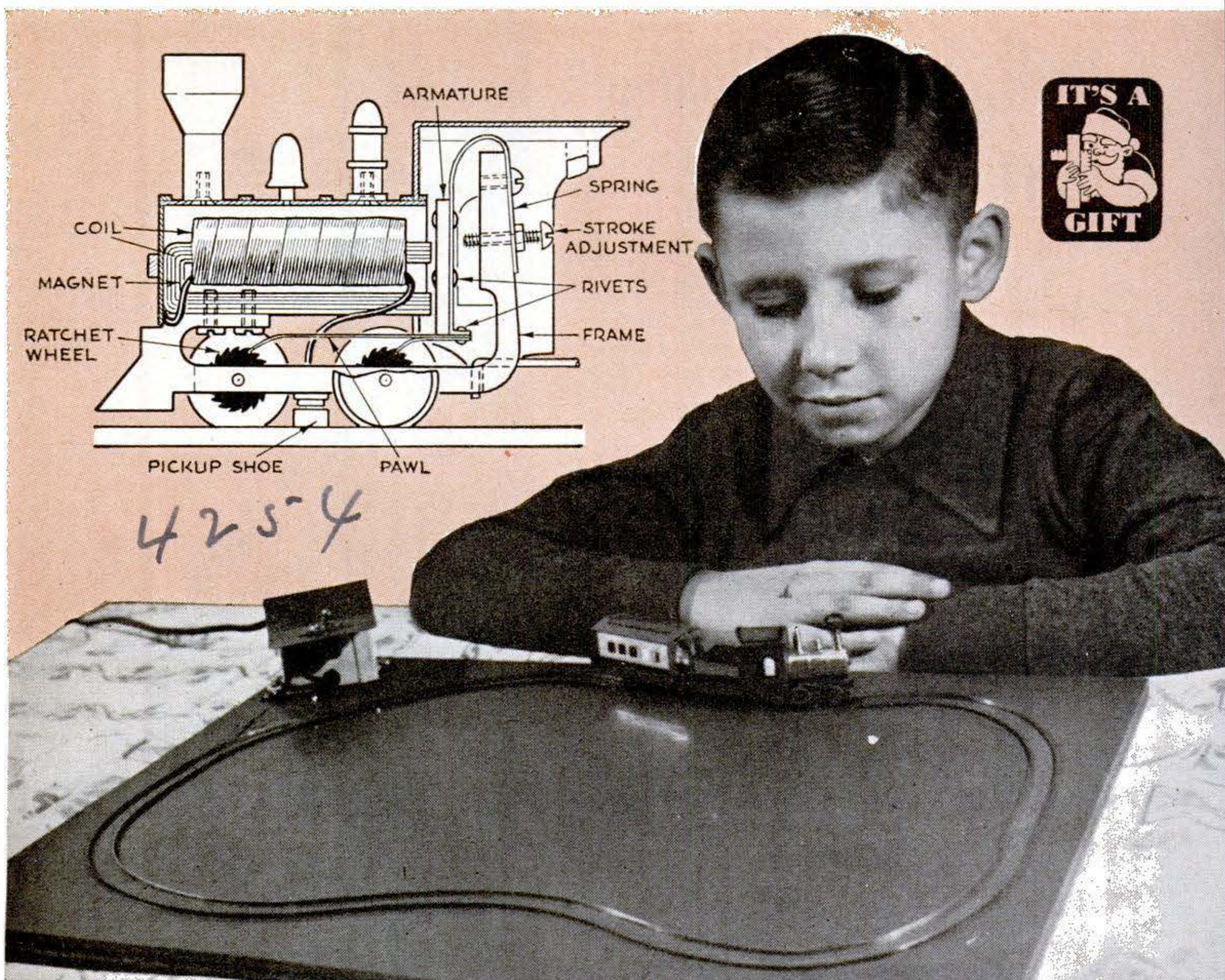
Now make the sliding door. Cut 22 pieces of pine $\frac{5}{16}$ " by $\frac{3}{4}$ " by $7\frac{1}{8}$ ". Sandpaper them smooth, rounding the edges so they will ride evenly over the guides. Build a jig, as shown in the drawing, and drill each piece. Then thread them on electric cord.

After nailing the knife bracket in place and screwing a knob to the door, give the inside of the case and the door two coats of white shellac. Then nail on the front framing.—Dick Hutchinson, Alhambra, Calif.



Test the sliding door before nailing the front and back pieces in place and before cutting off and fastening the cord. If some of the slats do not glide smoothly through the channels, slip them off the cord and give them an additional sanding. Sand the completed cabinet, above, and apply flat white paint and a coat of white enamel.





Here the completed train chugs around its brass track. The inset is a full-size drawing.

Tiny Toy Train Has Electric Ratchet Drive

By Alfred J. Brosseau

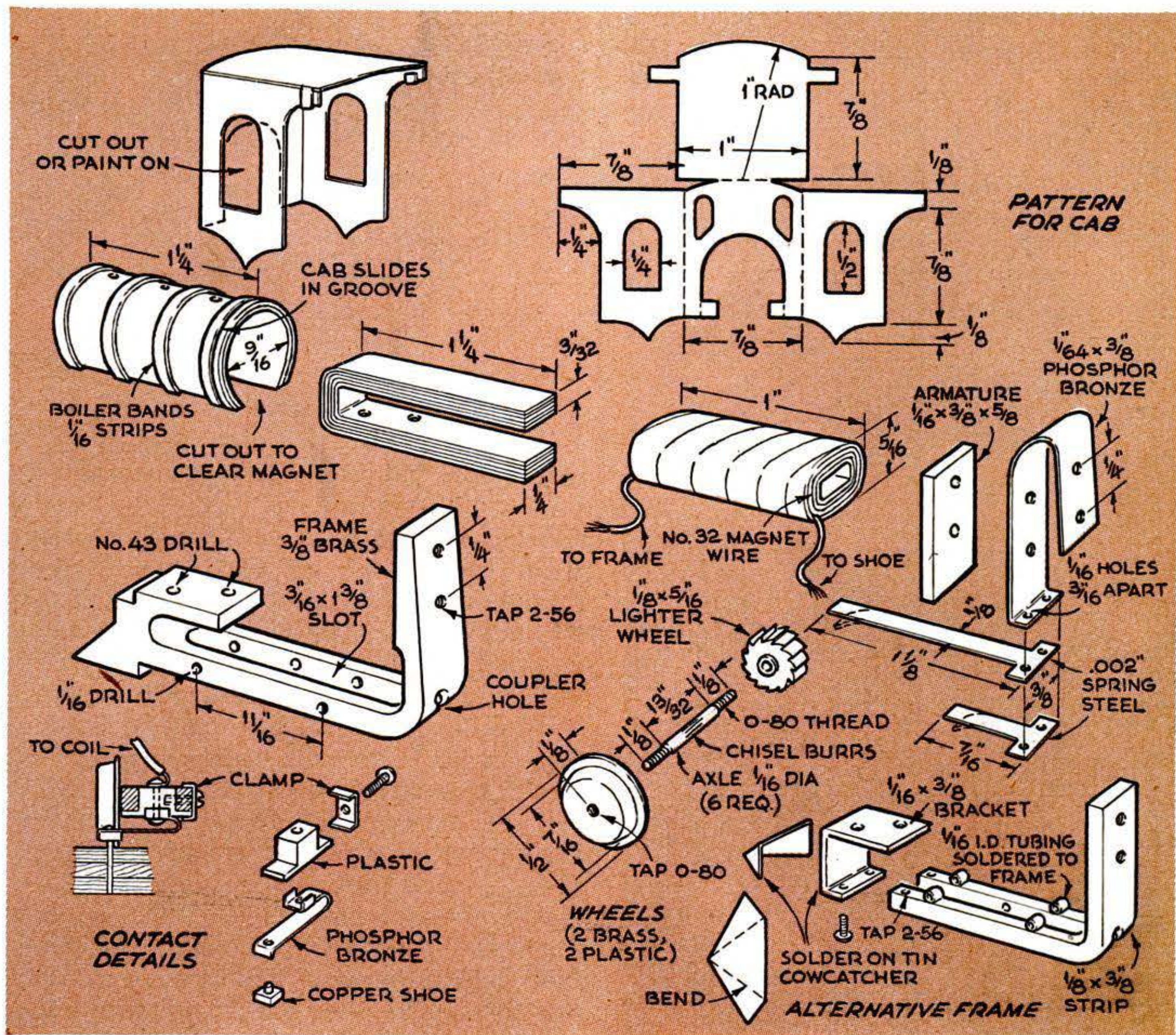
FOR the small-fry age that doesn't yet rate a scale-model train but wants "one that runs all by itself," here's a Casey Jones special Dad will have a lot of fun building.

Its drive is unusual. An AC magnet vibrates two pawls against ratchet wheels on the shafts, giving the wheels 120 kicks a second—enough to send the train scooting around the track. Painted in vivid colors, with the base for the track a bright green, the toy will be a happy surprise Christmas morning.

Although the locomotive parts are small, they don't require extreme precision. There

are two ways to make the frame, as shown in the drawing on the opposite page. Use a piece of brass stock $\frac{3}{8}$ " wide. The slot in the one-piece frame can be made by drilling out most of the metal and removing the rest with a saw and file. On the right side of the frame, the center hole is for mounting the pick-up shoe.

Wind the coil on a $\frac{1}{8}$ " by $\frac{1}{4}$ " arbor with No. 32 magnet wire and then bind it with adhesive tape. To make the magnet core, clamp seven pieces of soft iron in a vise and bend them to a right angle. Then clamp in a $\frac{1}{8}$ " piece of steel and bend the iron around it to form a U-shape. Use the frame as a jig to drill mounting holes in the core.

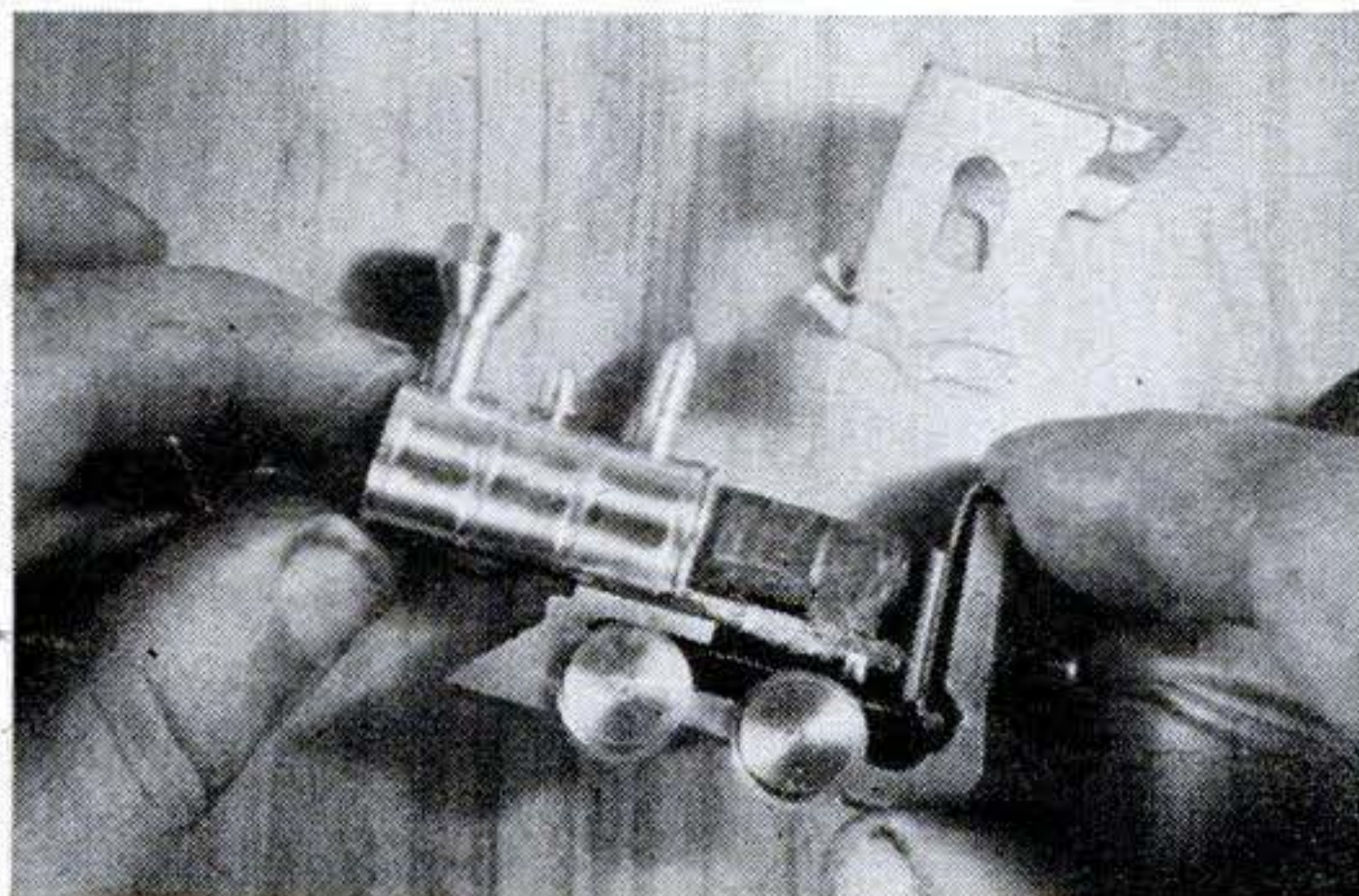


Above are details of the magnetic-drive engine. Armature spring should be tuned to 60 cycles.

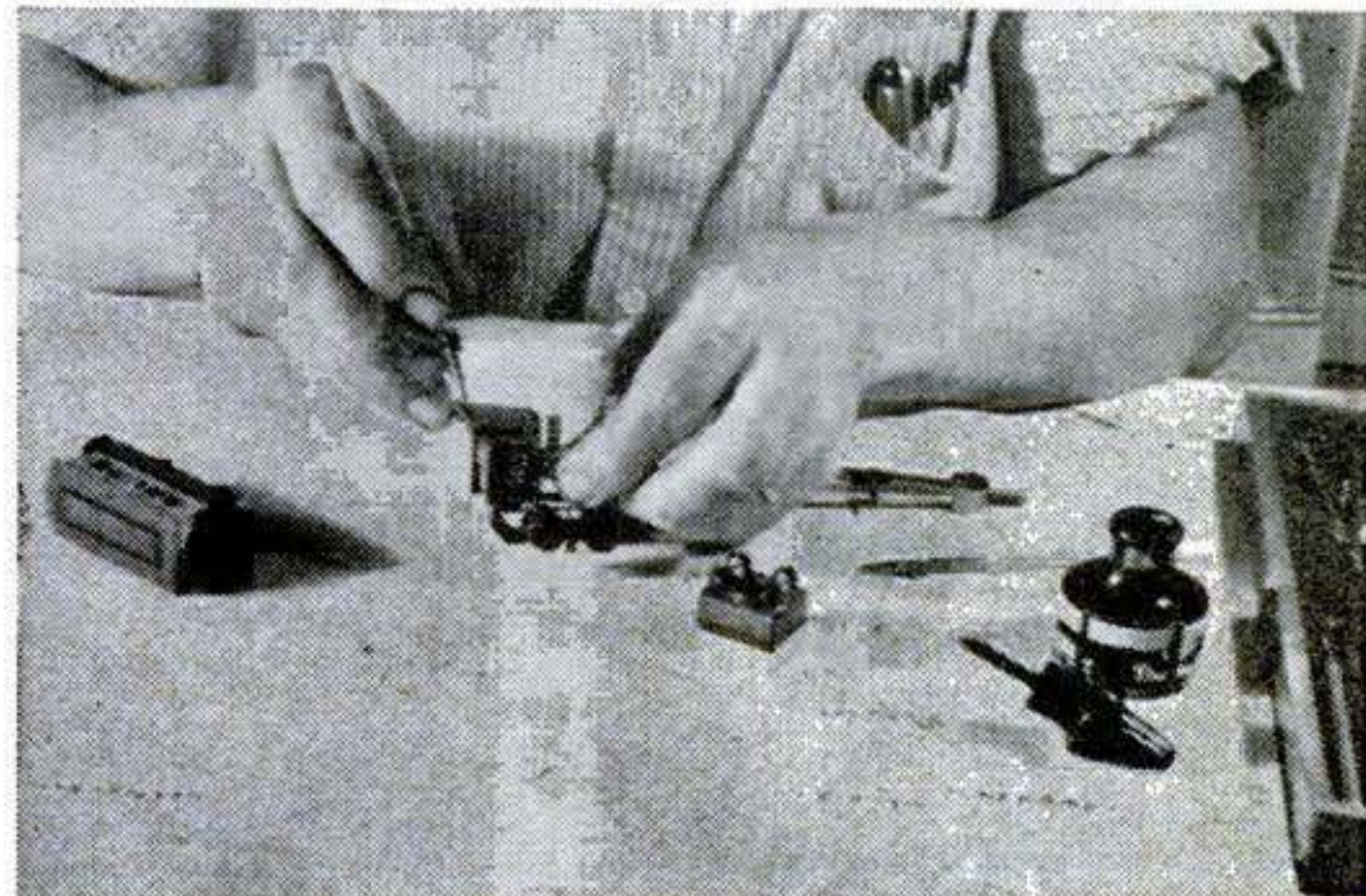
For the ratchet wheels, you can use cigarette-lighter wheels. Be sure to mount them with the hook of the teeth pointing rearward at the top, as shown. The contact shoe goes on the same side of the engine as the two plastic wheels. "Tune" the armature to 60-cycle frequency by filing it or weight-

ing it with solder until it vibrates vigorously.

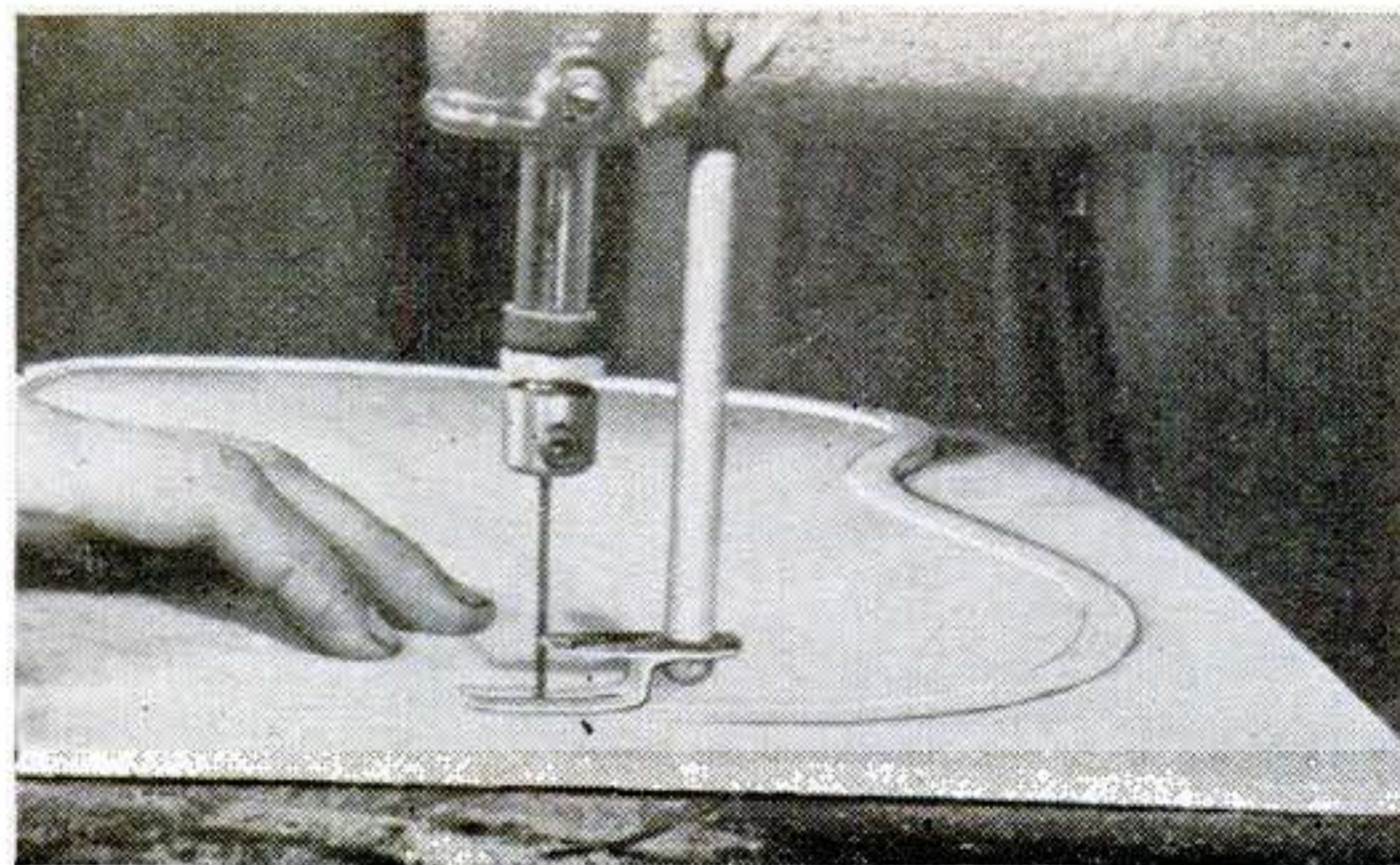
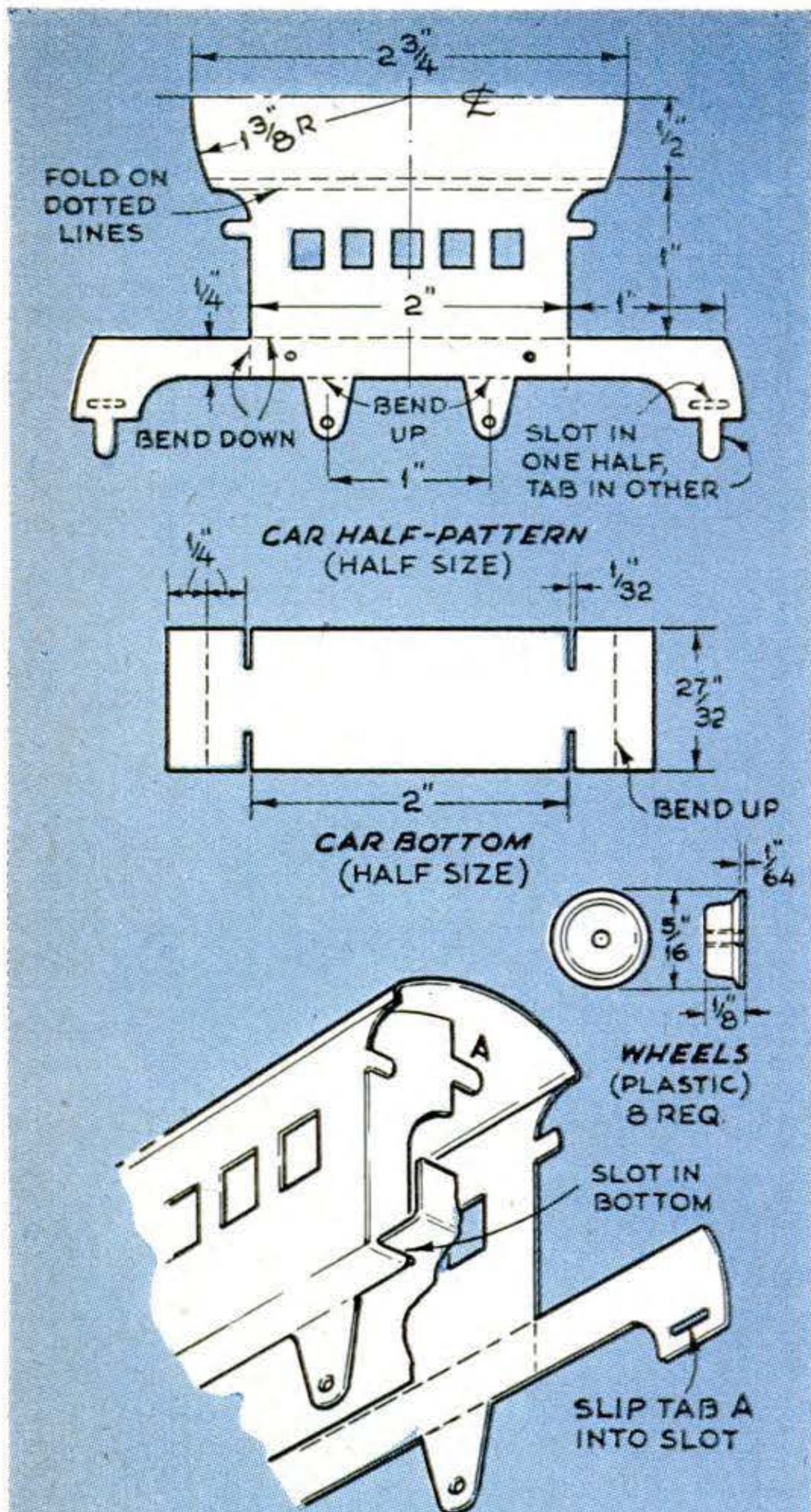
The boiler shell is a slotted aluminum or brass tube with bands of 1/16" metal cemented, soldered, or sprung on. The drawings include patterns for the cab, tender, and passenger car. You can sandwich sheet aluminum or tin plate between 1/4" plywood,



Fitting the boiler shell. Steam dome, bell, and smokestack are soldered on before assembly.



Putting on finishing touches. Paint the wheels, cab, and frame red. Then stripe with India ink.

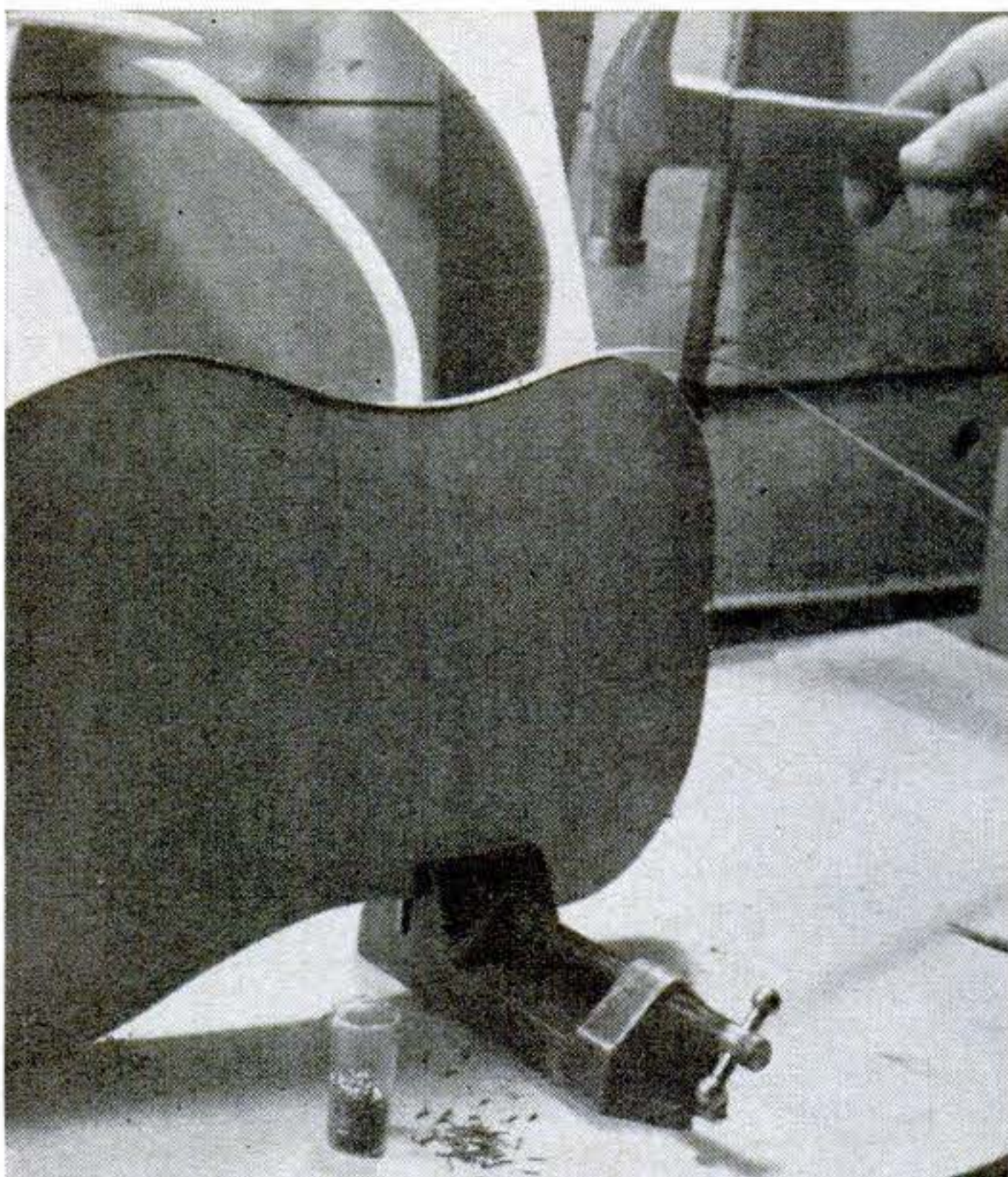
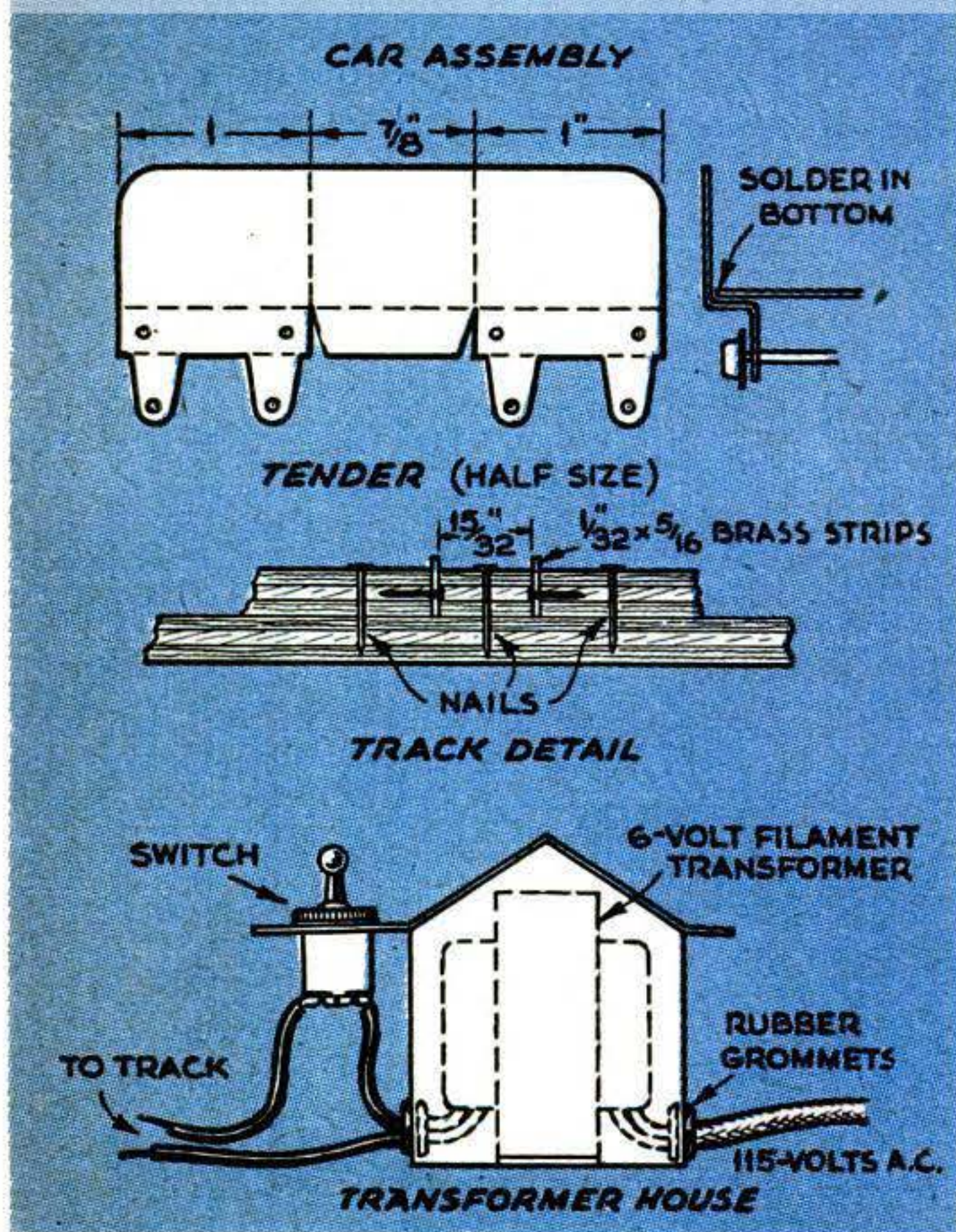


Cutting track layout. After first cut, carefully scribe a second line $15/32$ " in from the edge.

lay out the patterns on the wood, and cut them out on a jigsaw.

Make the track of two strips of brass, $1/32$ " thick and $5/16$ " wide. First lay out the line of the outside track and cut it out on the jig-saw. Then, on the inner piece of plywood, scribe a line $15/32$ " from the edge and cut along this, saving the narrow strip. Next drill very small holes in the bottom edges of the brass track strips and nail them to the two large pieces of plywood. Now take the narrow strip of plywood left by the jigsawing and put it back in place. Finally, nail all three pieces to a base.

After painting the engine and car, you can make decorative lines on them with India ink and a pen. Then connect a 6-volt transformer in the station to the track through a toggle switch, and highball. END



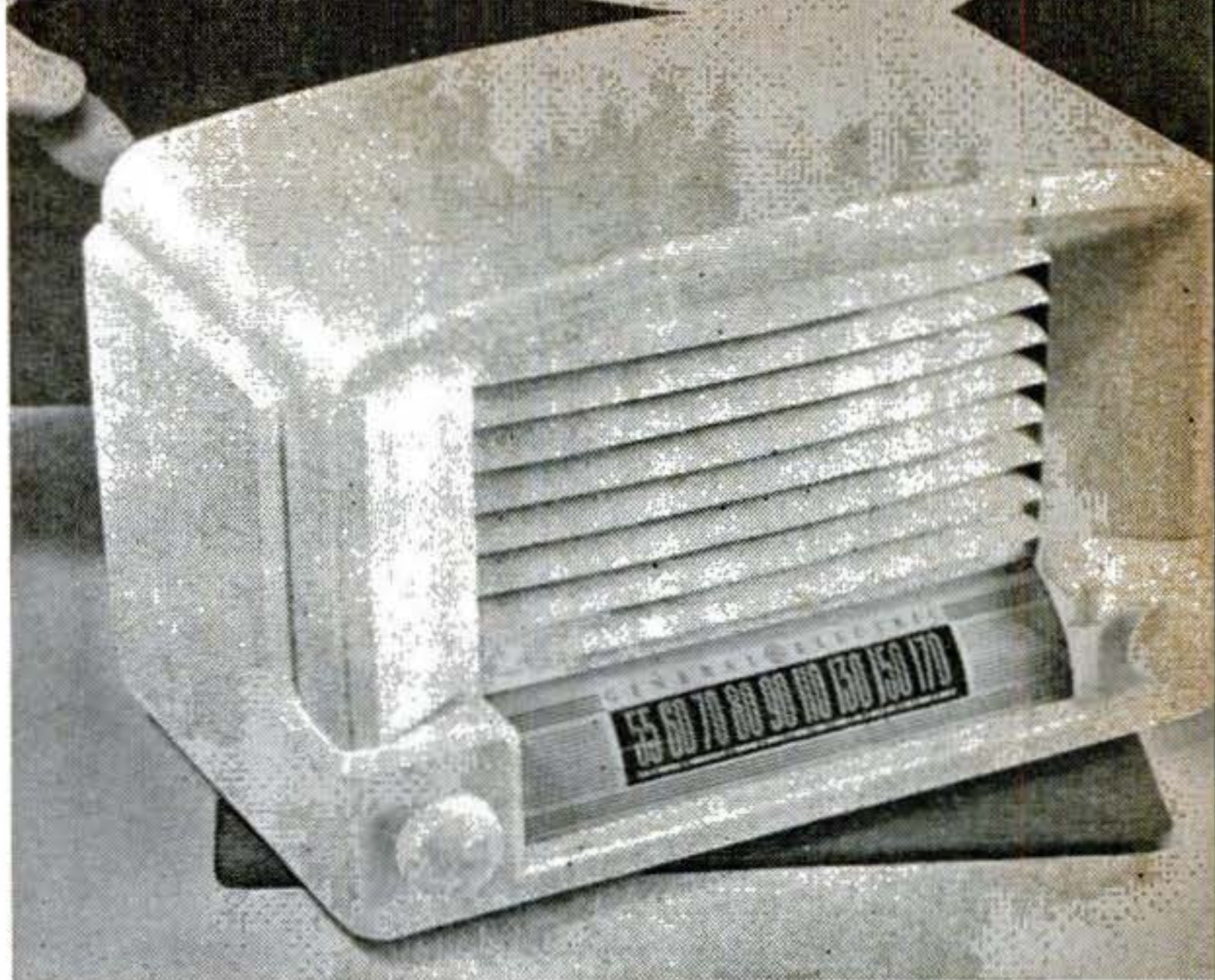
Assembling the track. Here the plywood is held in a vise for nailing brass strips to the edge.

Turntable Swings Small Radio for Peaking Signal

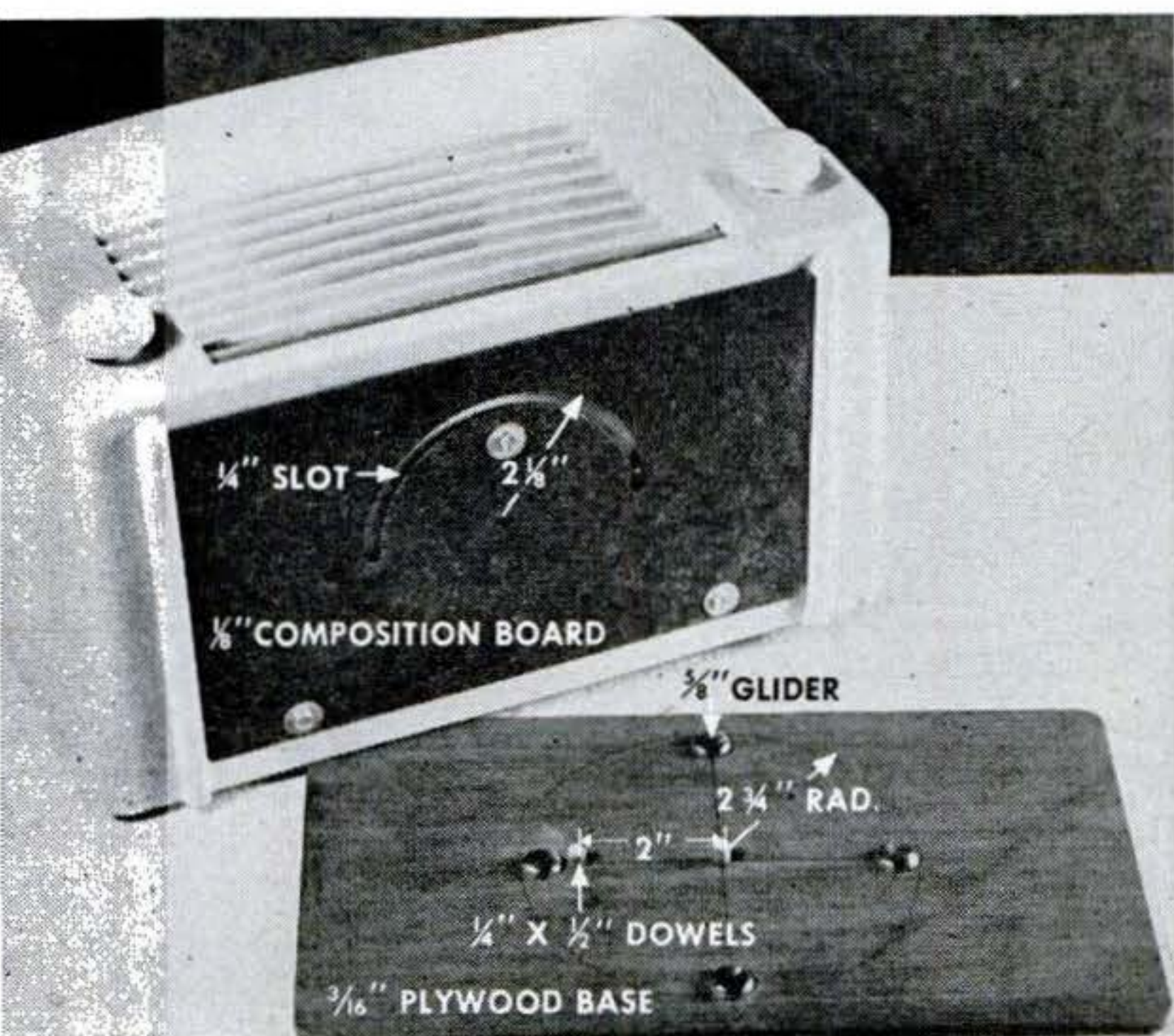
5400

TWO real advantages are yours with this turntable for midget radios. Placed on it, the radio will swivel at the touch of a finger for tuning from either side of a table. If the set has a built-in loop antenna, another touch swings it to favor the station to which the dial is set. This can often make the difference between good and bad reception.

Dimensions may have to be changed slightly to suit the cabinet. A piece of $\frac{1}{8}$ " composition board cut to fit the bottom of

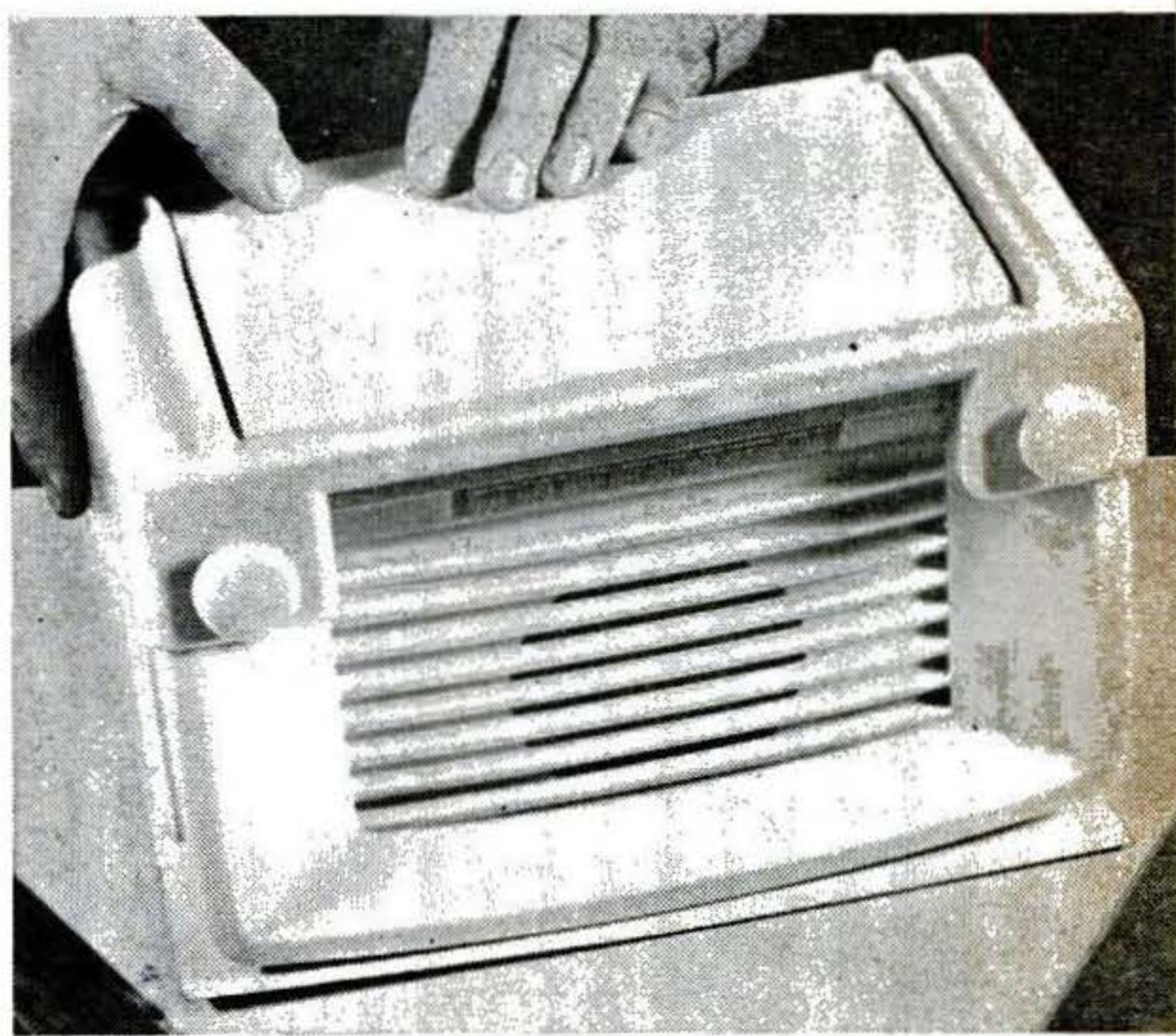


the receiver is held in place by the chassis screws. Make a plywood base slightly smaller than the radio bottom. Space the pivot and stop pins and three furniture glides to suit. A bolt and nut may be substituted for the pivot pin, but take care that it does not come into contact with the chassis.—*Glenn A. Wagner, Delmar, N. Y.*



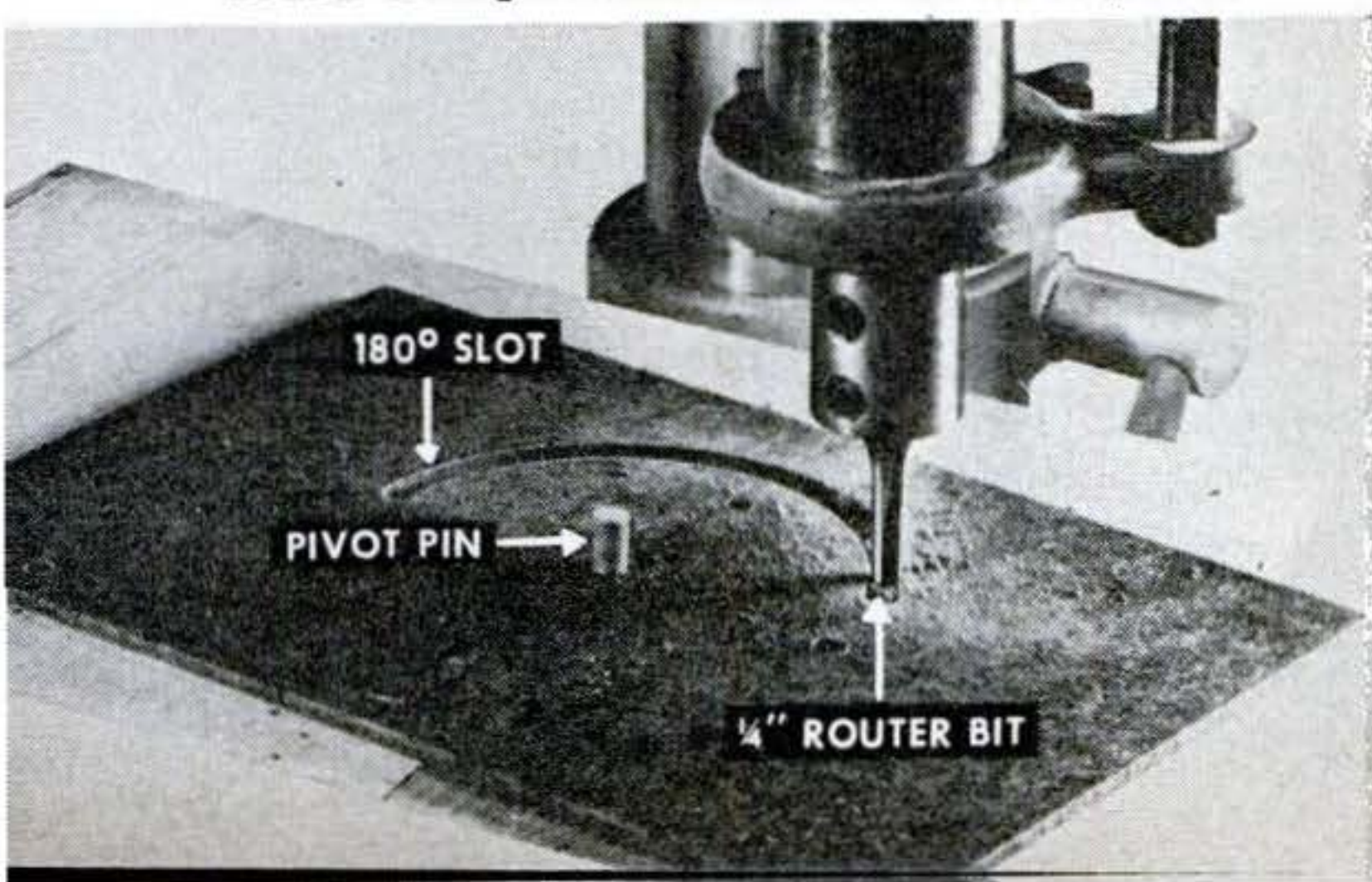
The composition-board plate is fastened to the receiver by the chassis screws. If desired, felt may be glued to the bottom of the base.

The arc slot for the stop pin can be scroll-sawed, or routed as above. A dowel is set in a board clamped beneath to act as a pivot.

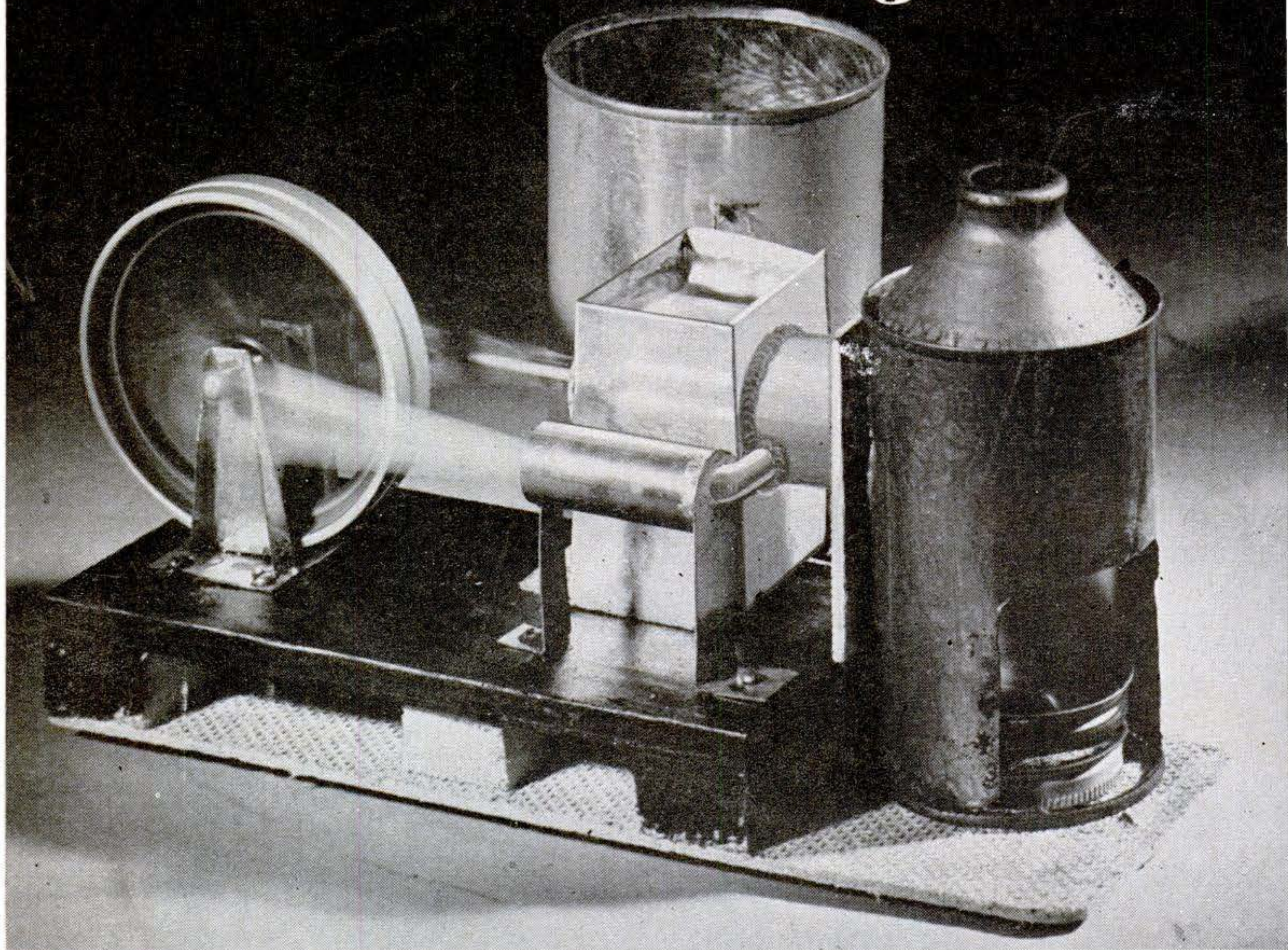


To locate the screw centers, cut a piece of paper the size of the plate, press it down, and transfer the imprinted marks for drilling.

Sand and finish the base before hammering in the $\frac{3}{8}$ " furniture glides. The $\frac{1}{4}$ " by $\frac{1}{2}$ " dowel pins should be glued into holes in the base.



Model Air Engine Runs on Any Fuel



Fired up with anything from wood shavings to a Bunsen burner, the engine does a steady 400

6216

Tin snips and soldering iron are your chief tools for building this model of a 19th Century power plant.

By Harry Walton

PERHAPS the rebirth of the hot-air engine (see PS, Feb. '48, p. 145) gave you a yen to see this old-timer in action. Although the improved Philips design would require careful machining, you can easily make a model of the old two-cylinder type.

The little engine shown demonstrates some of the advantages of this prime mover—quietness, full-stroke double action, and

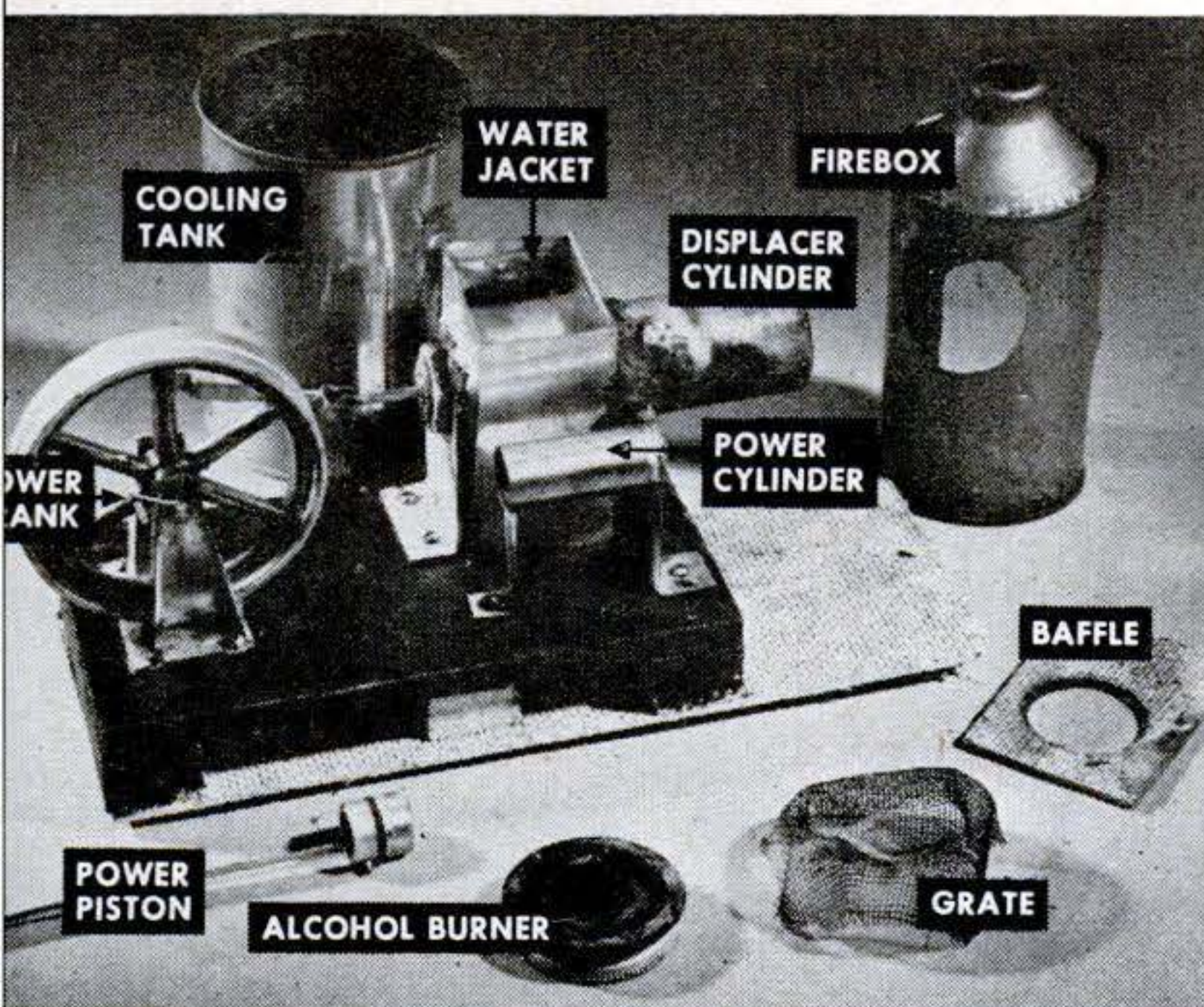
r.p.m. It has no boiler or safety valve. Power piston delivers two impulses every revolution.

an entire lack of choosiness about fuel. It has run on alcohol, fire kindlers, gas, wood shavings, and even matchsticks!

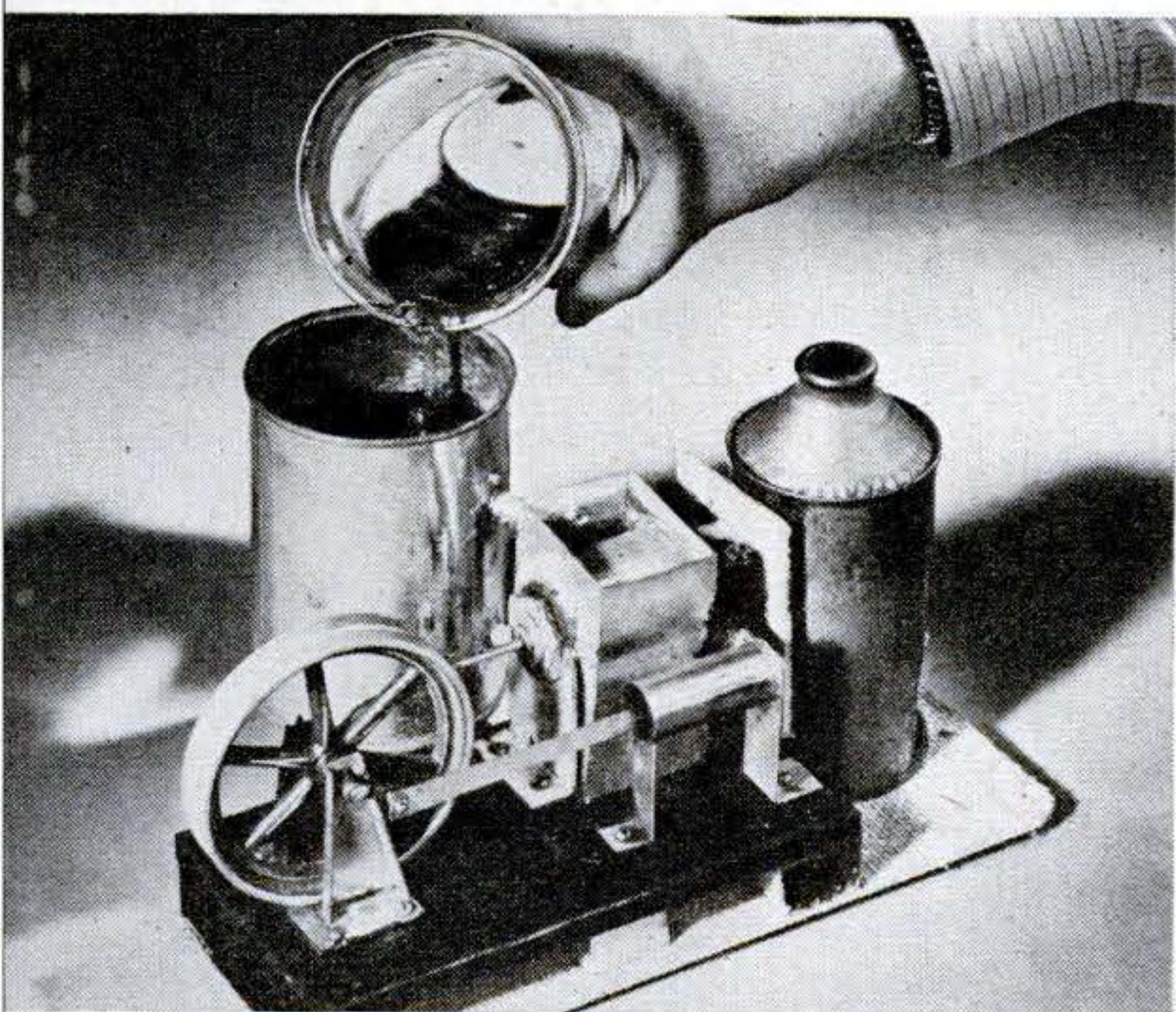
Designed for easy construction, the model has no critical dimensions. Those shown may be altered so long as similar cylinder proportions are maintained and cranks give proper piston action.

An old electrolytic radio condenser with a seamless drawn can and a mounting nut forms the displacer cylinder. Remove the nut, pry out the closing disk, and empty the contents. Drill or punch a hole to fit the port tube midway of the cylinder.

A small condenser can, film container,



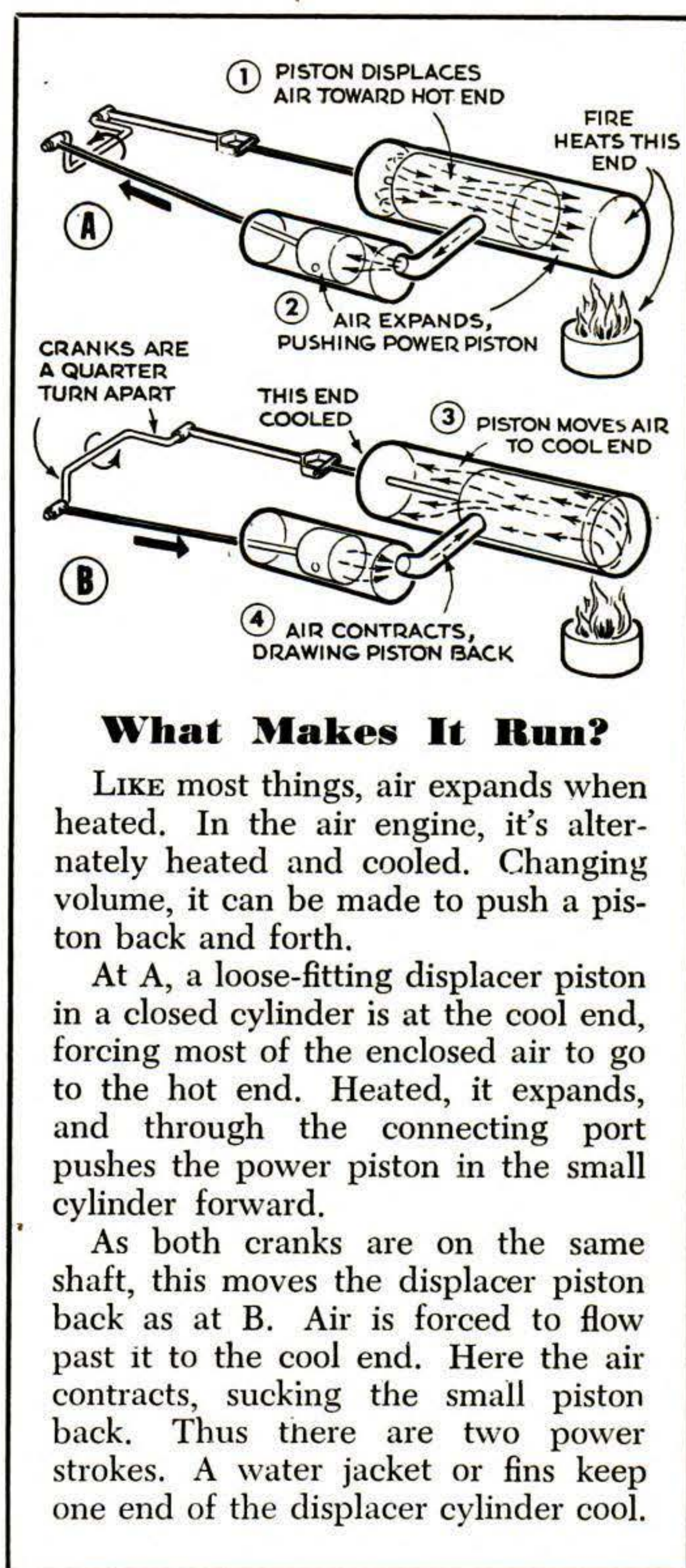
Fly-screen grate burns matches or charcoal. Baffle slips on displacer just ahead of firebox.



Heat differential is key to power. Extra tin-can tank keeps water in jacket from boiling.

or bouillon-cube can that will fit into the displacer cylinder *loosely*—leaving a gap of about $1/16''$ all around—becomes the displacer piston. It must be light and fitted with a lid so that you can close both ends. Run the piston rod right through, peening over the end. To keep the piston from sliding on the rod, solder a washer at the front end or hammer a flat crimp on the rod.

You'll have to bush the hole in the end disk through which the condenser wires passed. Drive in a brass or lead plug and drill it a close sliding fit for the piston rod. It's a good dodge to drill undersize, and then file a long flat bevel from one end on



What Makes It Run?

LIKE most things, air expands when heated. In the air engine, it's alternately heated and cooled. Changing volume, it can be made to push a piston back and forth.

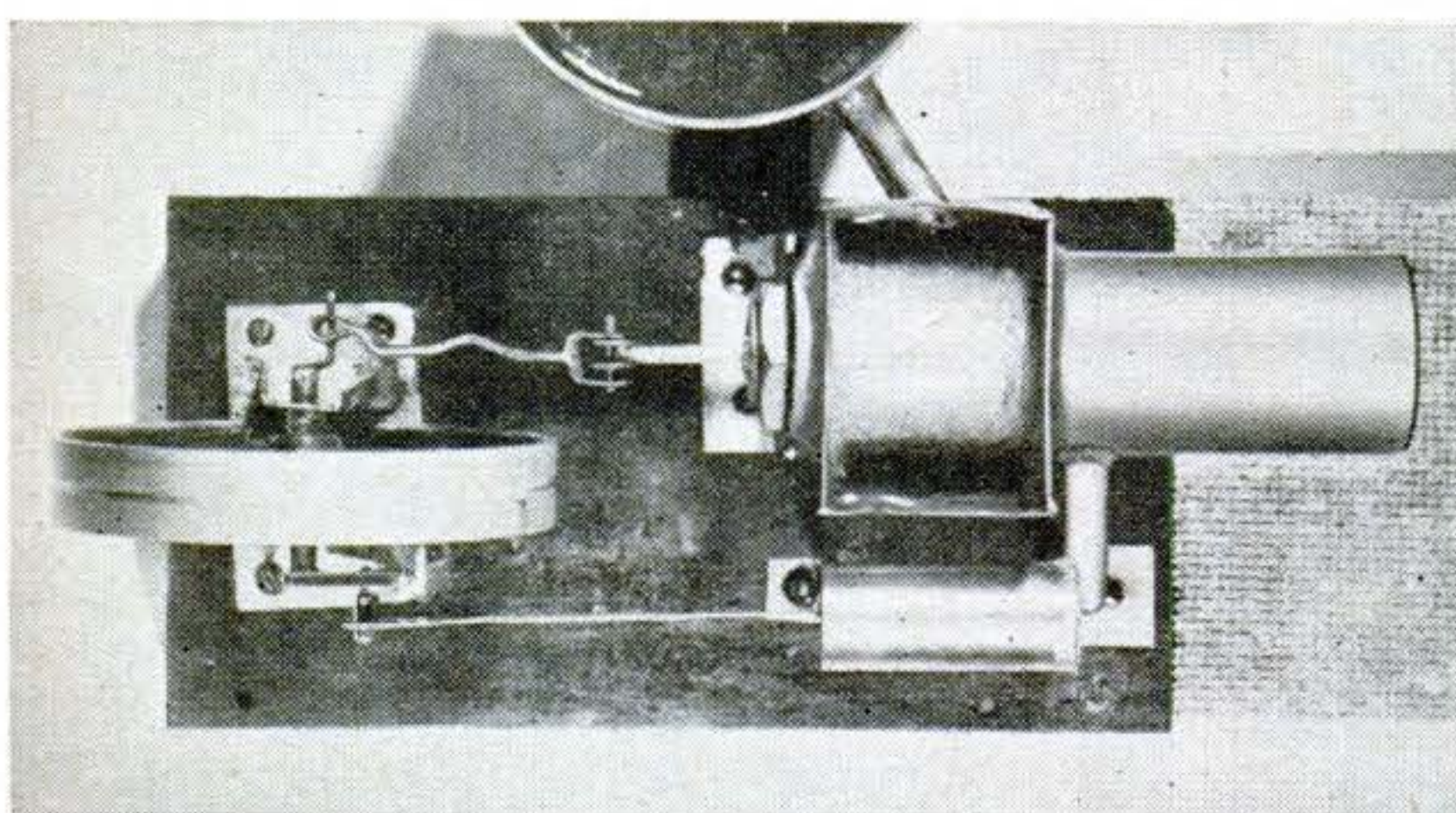
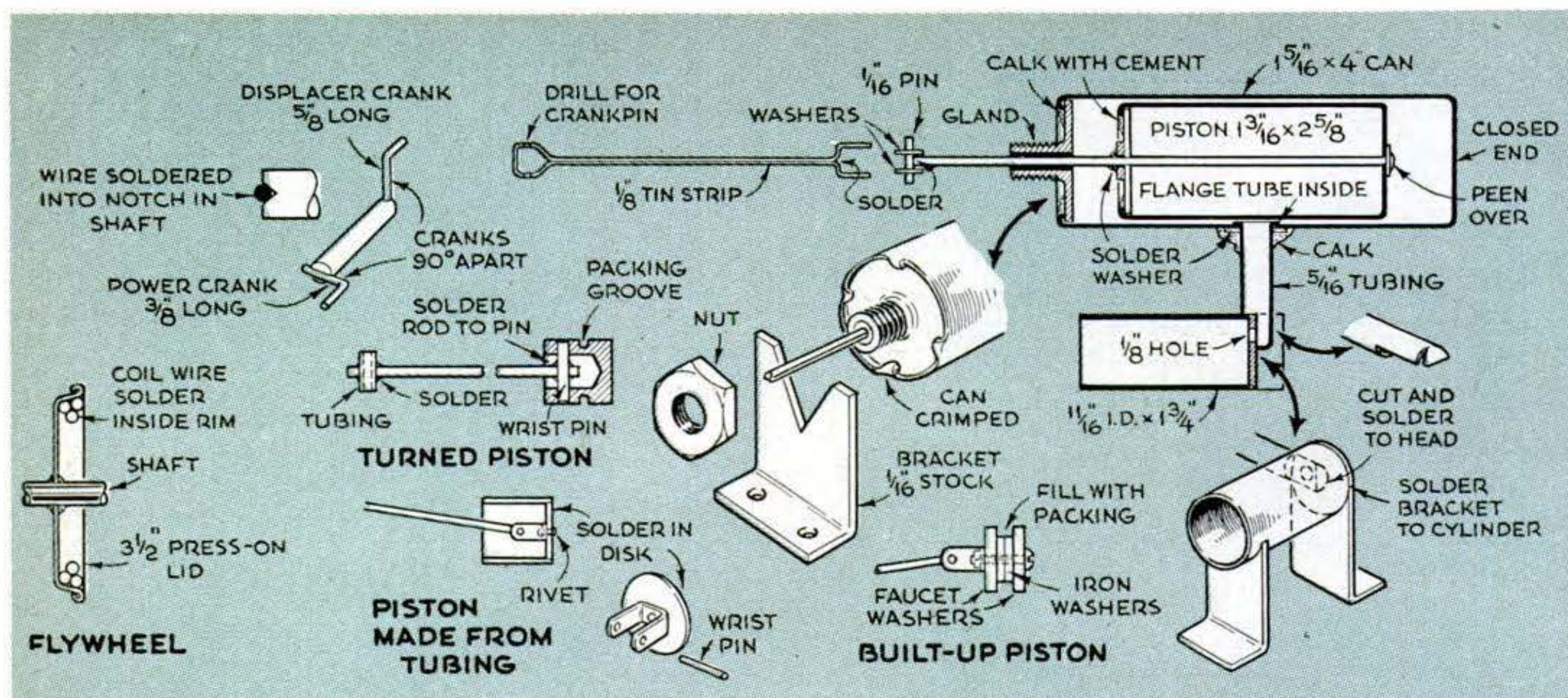
At A, a loose-fitting displacer piston in a closed cylinder is at the cool end, forcing most of the enclosed air to go to the hot end. Heated, it expands, and through the connecting port pushes the power piston in the small cylinder forward.

As both cranks are on the same shaft, this moves the displacer piston back as at B. Air is forced to flow past it to the cool end. Here the air contracts, sucking the small piston back. Thus there are two power strokes. A water jacket or fins keep one end of the displacer cylinder cool.

a piece of the piston-rod material, for use as a reamer. The rod must slide freely without spilling air, and the gland should be long enough to carry the load of the piston without binding.

File the port tube to fit the power cylinder as in the drawing, bending down the end to close it. Then flange over the other end slightly so that it won't slip out of the displacer cylinder after it's inserted from inside. Solder on a washer to keep it from slipping back in.

Calk any holes in the displacer piston with auto body solder, black furnace cement, or similar metallic putty. The piston must



Plan view with firebox removed. Flywheel goes between bearings. Water jacket surrounds $1\frac{1}{2}$ " of big cylinder.

be airtight and securely fixed on its rod.

The water jacket is a tin-plate box. Make two cylinder-size holes in each end of a strip and bend it U-shaped. Slip it on the cylinder and solder on two side plates. The joints between tank and cylinder can be calked later.

With the piston inside, crimp over the can to hold the end disk in. Calk all around, and mount on a notched bracket, drawing up the condenser nut to clamp the crimped end tightly. The piston should slide freely the full length of the cylinder.

A piece of seamless brass tube makes a good power cylinder. The back tin-plate bracket also forms the cylinder head. Put a $\frac{1}{8}$ " hole in it, solder the bracket in place, and solder the port tube over the hole. Be sure all is airtight. Then mount the two cylinders on a base and calk around the port tube and water jacket. For continuous running, connect a tin-can cooling tank with two tubes to the top and bottom of the jacket.

A bit of aluminum was turned to make the power piston, with one packing groove.

This can be done on a wood lathe, a drill press, or in an electric drill. If you can find a piece of tubing that slides closely in the cylinder (or can be made to do so with emery cloth) you can solder on a piston head to which is riveted a wrist-pin bearing. You can also build up a piston from washers, turned to diameter in a drill chuck by applying a file.

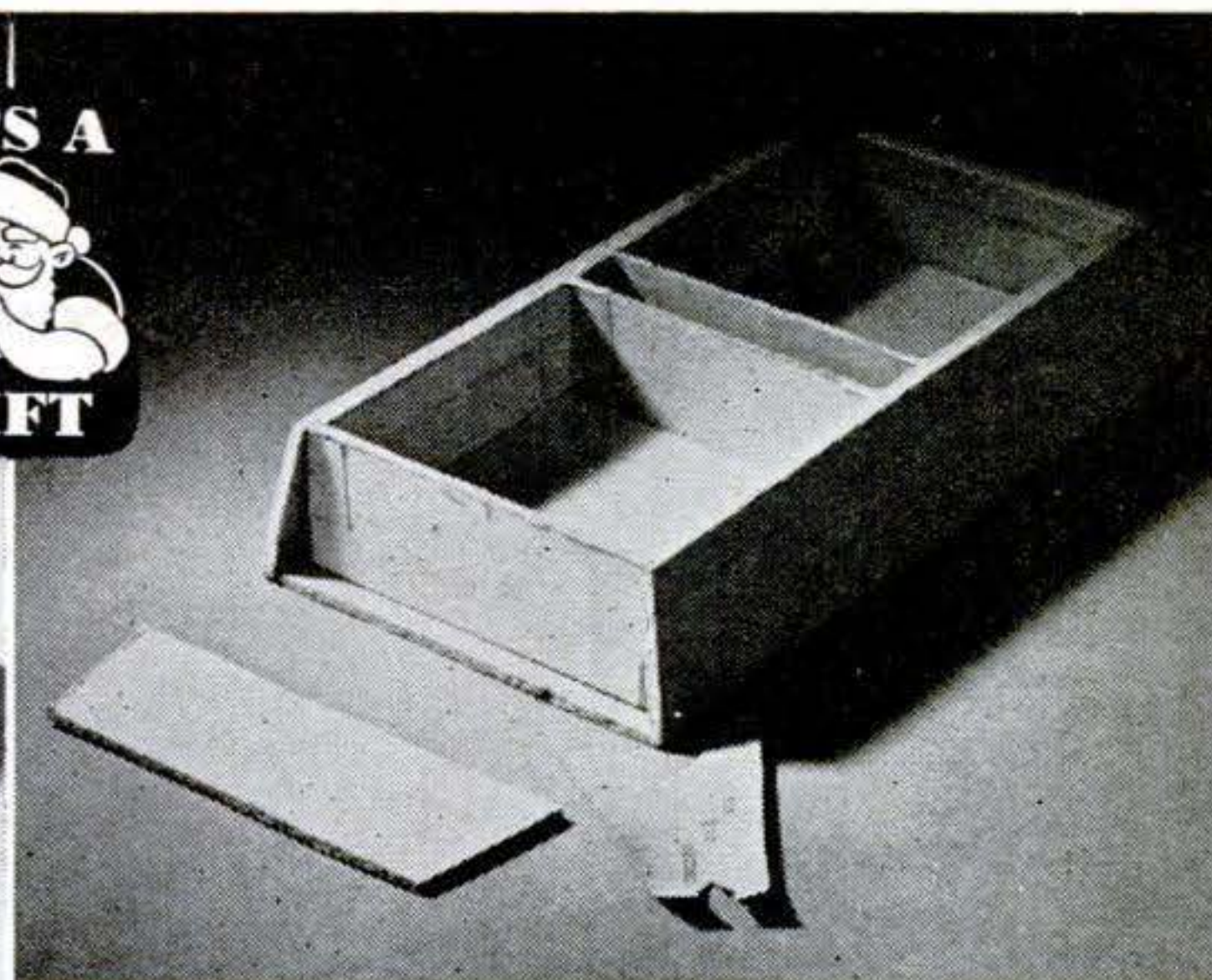
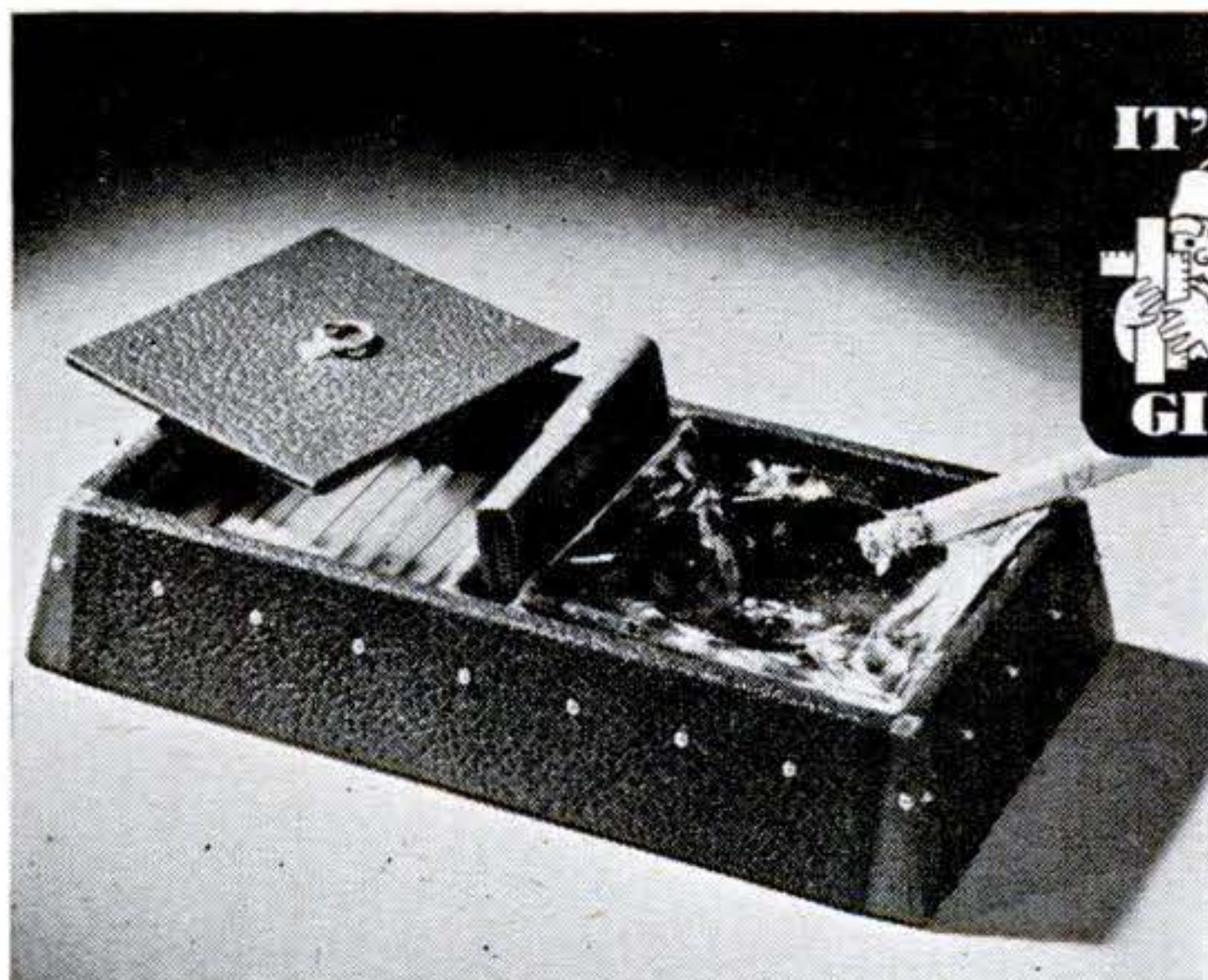
Bearing standards and connecting rods are tin plate. A flywheel can be improvised from a can lid as shown. Space the cranks 90

deg. apart and bend the rods to get piston strokes right. With only the displacer connected, the flywheel should spin easily. The power piston, fitted with faucet packing and oiled, should have a compression bounce.

Cut a hole in a bit of asbestos board and slip it on the hot end of the big cylinder as a heat baffle. Make a firebox from a flare-top beer can. Roll up a strip of soft sheet asbestos in a jar lid for an alcohol burner, or make a grate out of some screening for solid fuel.

Fill the cooling tank, light up, and in less than a minute the engine should respond to a starting twist by running merrily. If it doesn't, look for air leaks at the calked joints, a leaky piston-rod gland, or mechanical binding. To check leaks, remove the power piston and insert a cork with a hole in which a bicycle-pump tube is fitted. Put the engine under water and pump.

You can demonstrate the action by holding the power-piston rod in the fingers and sliding the displacer rod back and forth. The power piston should follow it. **END**



Decorate the finished project with brass nail heads and buy a $3\frac{3}{8}$ " square glass ash tray at

a dime store. At right, an endpiece has been removed for a view of the interior construction.

Leather-Covered Smoking Set

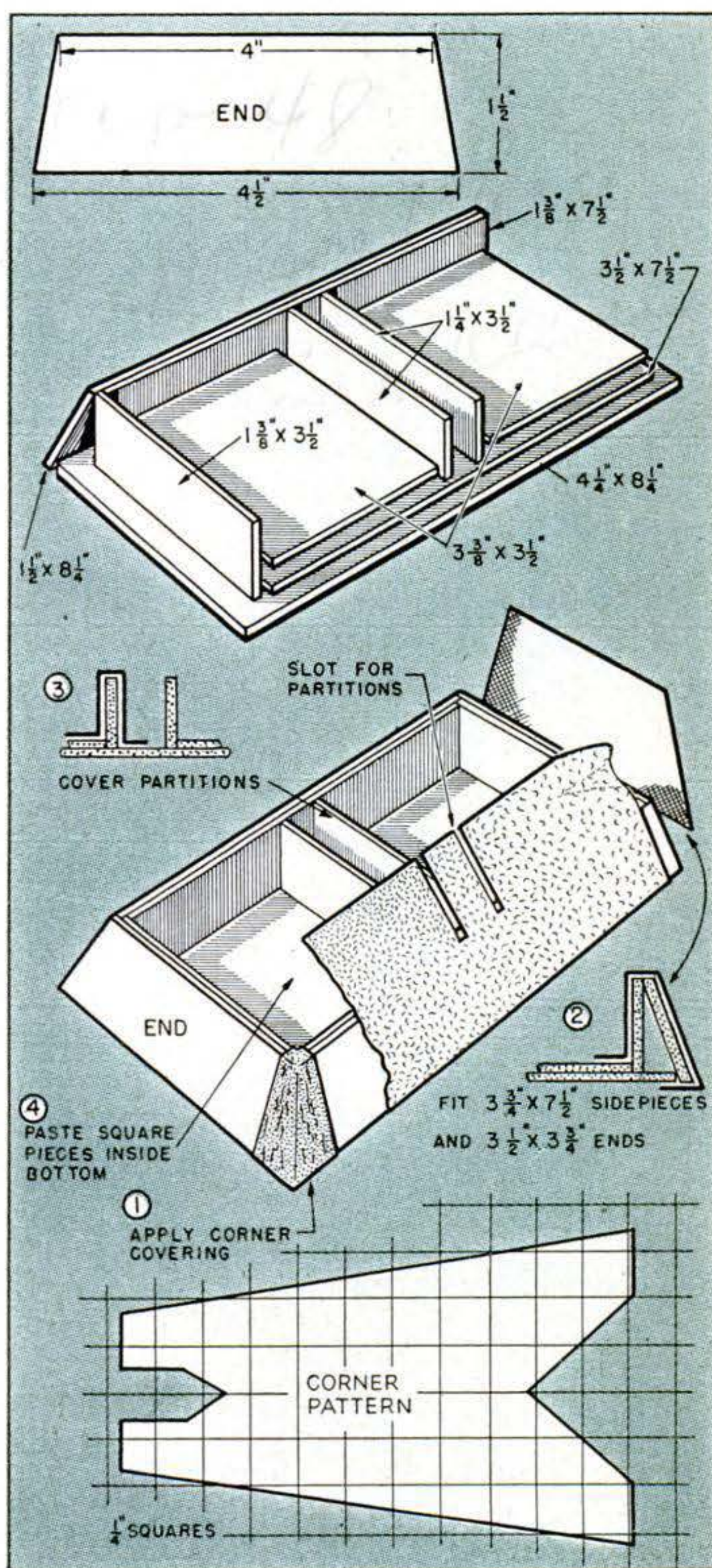
CARDBOARD, artificial leather, and glue are the main materials needed for this combination ash tray, cigarette box, and match holder. Tools used are a knife and scissors.

Make the box first, cutting out the pieces and gluing them together. After the box is assembled, glue it to the $4\frac{1}{4}$ " by $8\frac{1}{4}$ " base, and then attach the slanting sides and ends. As you go along with the construction, glue 1" wide strips of wrapping paper along each joint to strengthen the form.

The set will look nicer if you finish it in two shades of artificial leather. About $\frac{1}{4}$ yd. of each color will make two complete sets. Use one color for the corners and bottoms and the other color for sides, partitions, and cover. The cover is a $3\frac{3}{8}$ " square of cardboard fitted with a pull ring. Glue on the leather before screwing the pull ring in place.

Corner pieces can be cut by the pattern. Glue these on first, fitting them so the wide end will overlap the bottom of the form and the narrow end will overlap inside the form. Cut the side coverings $3\frac{3}{4}$ " by $7\frac{1}{2}$ ", overlapping $\frac{1}{4}$ " on the bottom. Don't forget to cut narrow slits in the sidepieces to fit the partitions. The endpieces are glued on the same way, so they overlap the bottom. Cut two $3\frac{3}{4}$ " squares and glue them to the bottom of each section. Lastly, cut a $4\frac{1}{4}$ " by $8\frac{1}{4}$ " piece for the outside of the bottom.

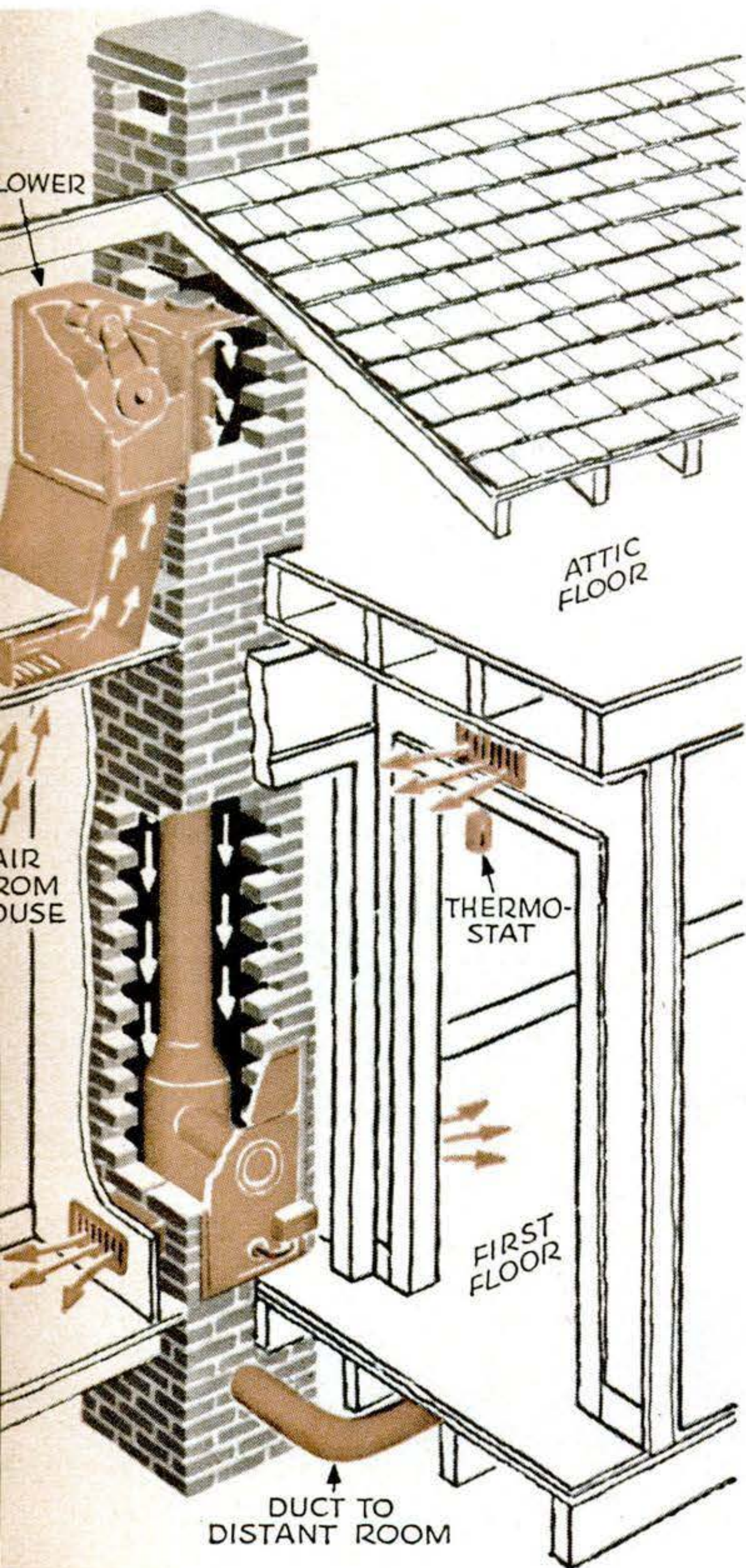
The lid rests on a thin cedarwood lining glued in the cigarette container.—David Wishner and Jay Obrien, Brooklyn, N. Y.



5480 5219 5765 2488

New Furnaces

Lick Fuel Shortages



Hidden inside chimney, this novel oil furnace is designed to save space in new homes. Attic fan forces air down along a heated steel pipe in chimney and out through registers at floor level. Under-floor ducts carry heat to distant rooms. The chimney must be specially built.

WITH fuel scarce in recent years, you'd have given a big welcome to some of the new home heaters now on the market. Not only do they get more heat from the fuel you burn, but if one fuel becomes short or too expensive, you quickly convert to another that's in better supply or less costly.

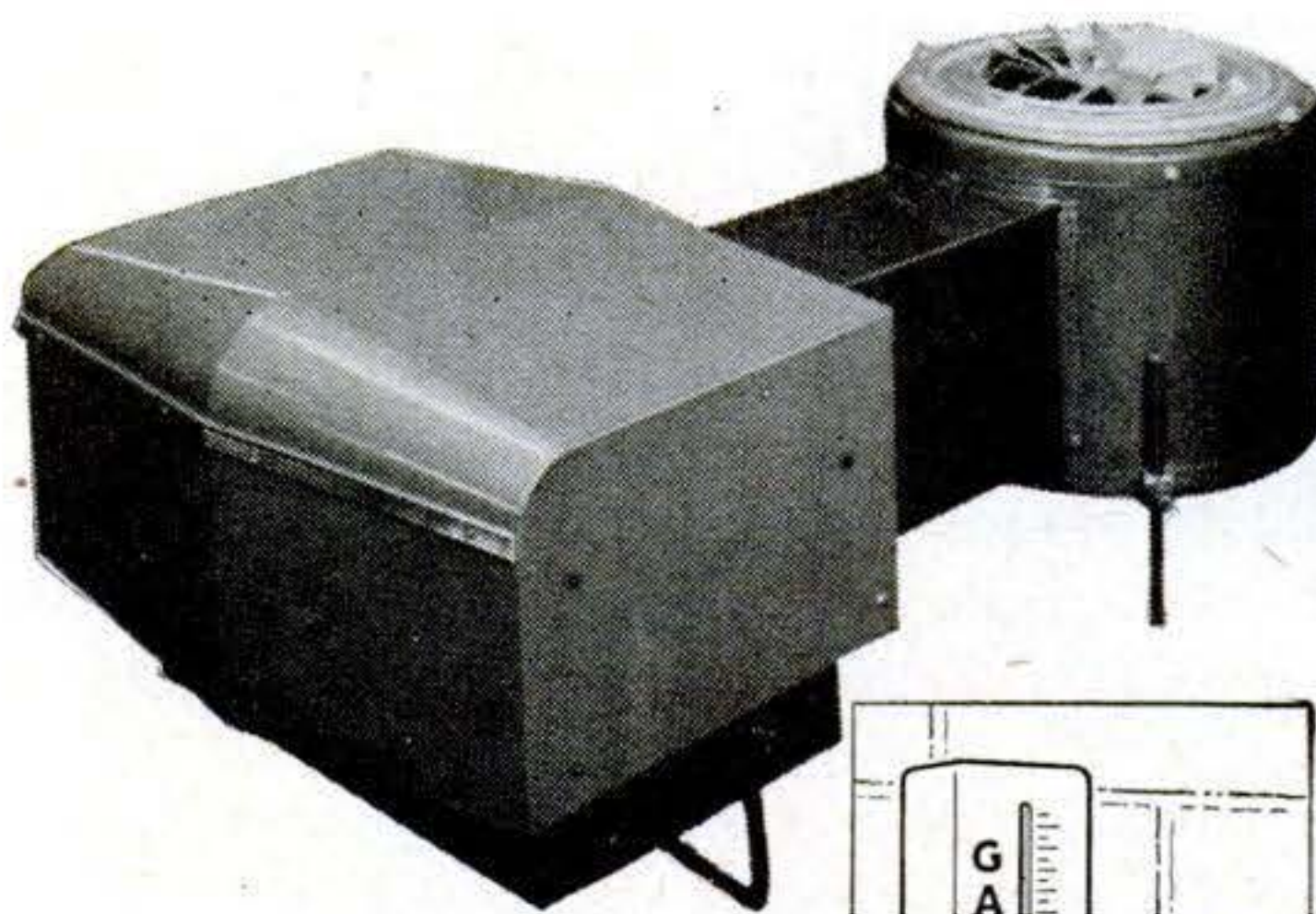
In one case, you just flip a switch. Push it one way and you start up the oil burner. Push it the other, and you're all set to burn coal.

You'll find this convenience in a double-duty heater now being produced by the Diesel Oil Burner Corporation, of Jamaica, N. Y. This unit has two separate combustion chambers housed in a single compact jacket, one for coal, one for oil. The heater is suitable either for steam or hot water.

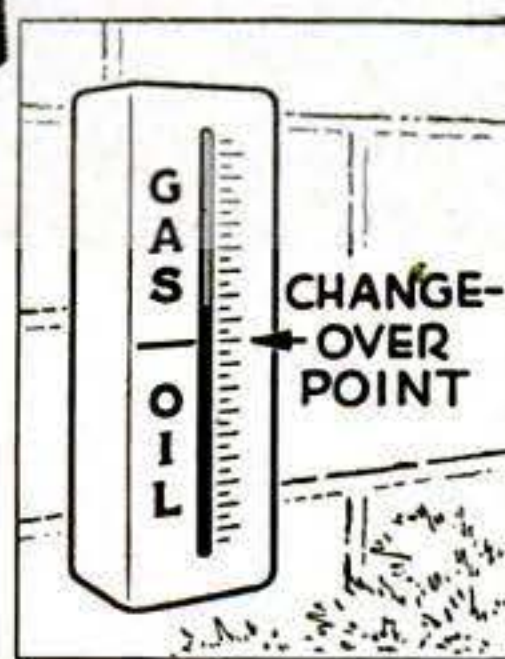
Chrysler Airtemp, Norge, and Spencer are other manufacturers who have heeded the lesson of the war years, when many home owners had difficulty changing over their plants to another fuel.

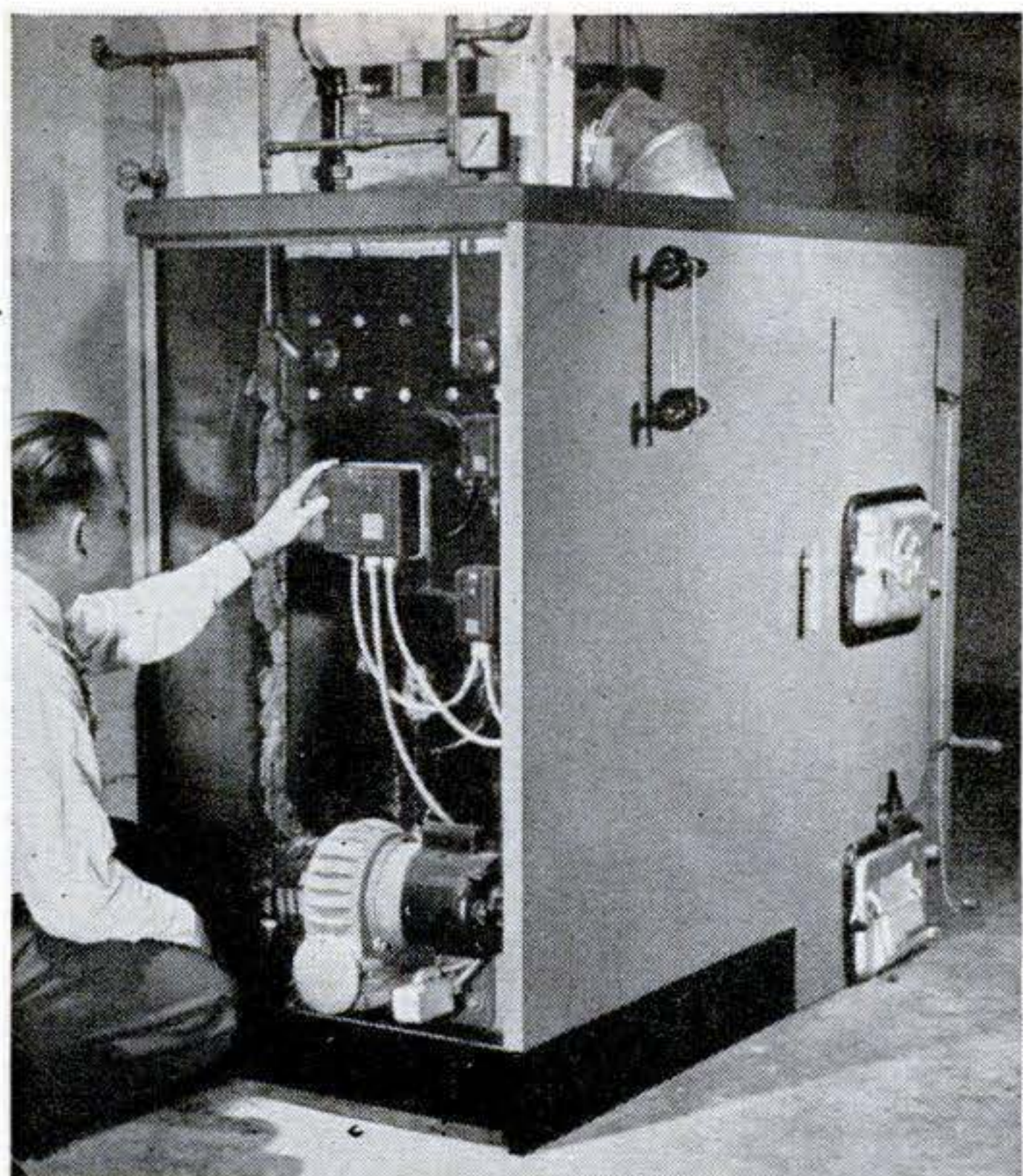
With any of these makes, a hand-fired coal furnace is now the basic unit. Starting with this, you can later make it automatic by adding a coal stoker, an oil burner, or a gas burner. When the change is to oil or gas, the coal grates are removed and stored away for emergency use.

A novel gas-oil conversion unit has been



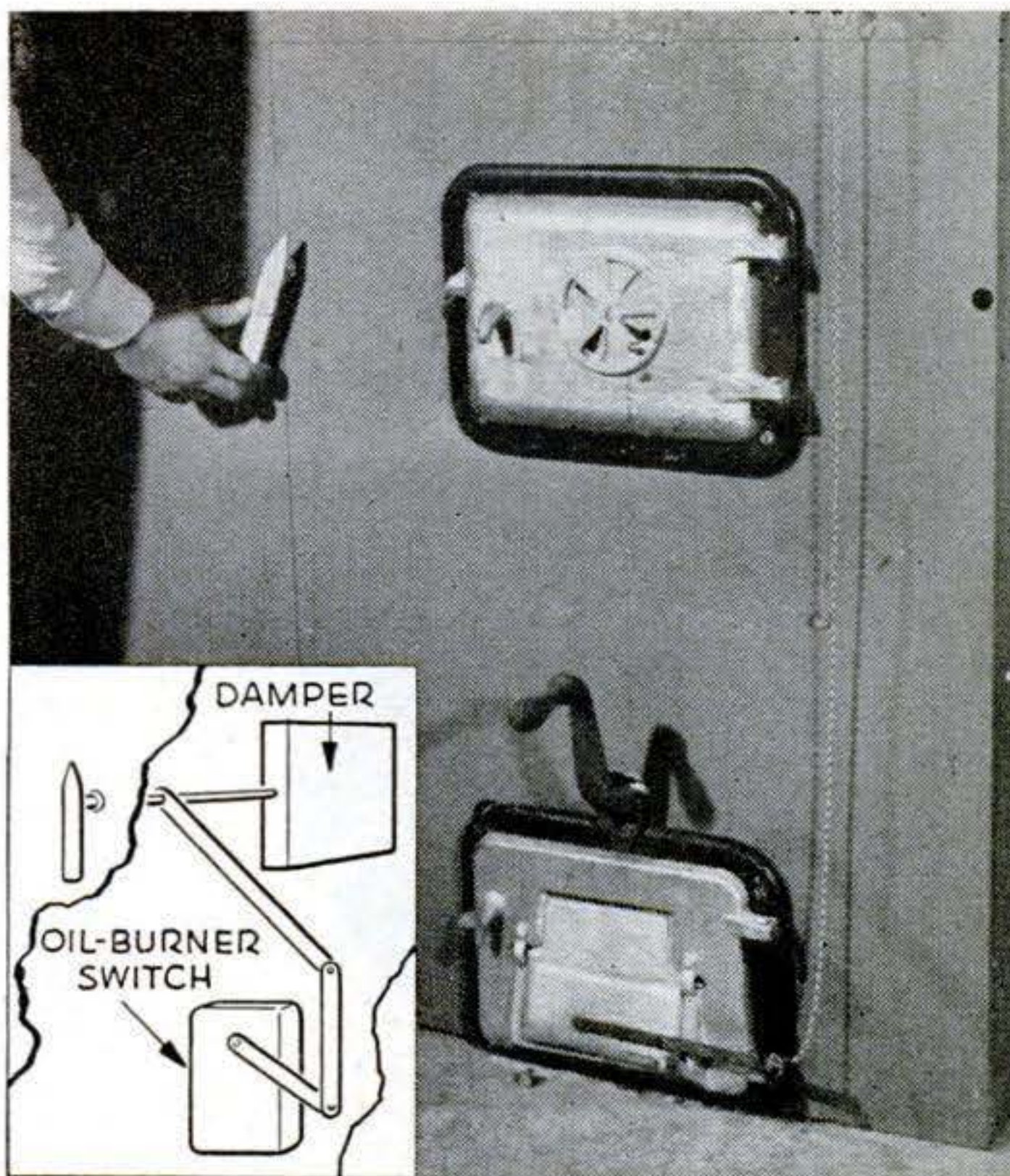
A thermostat outside house switches this heating unit back and forth between oil and gas. Oil is used only if temperature drop puts heavy load on local gas supply.





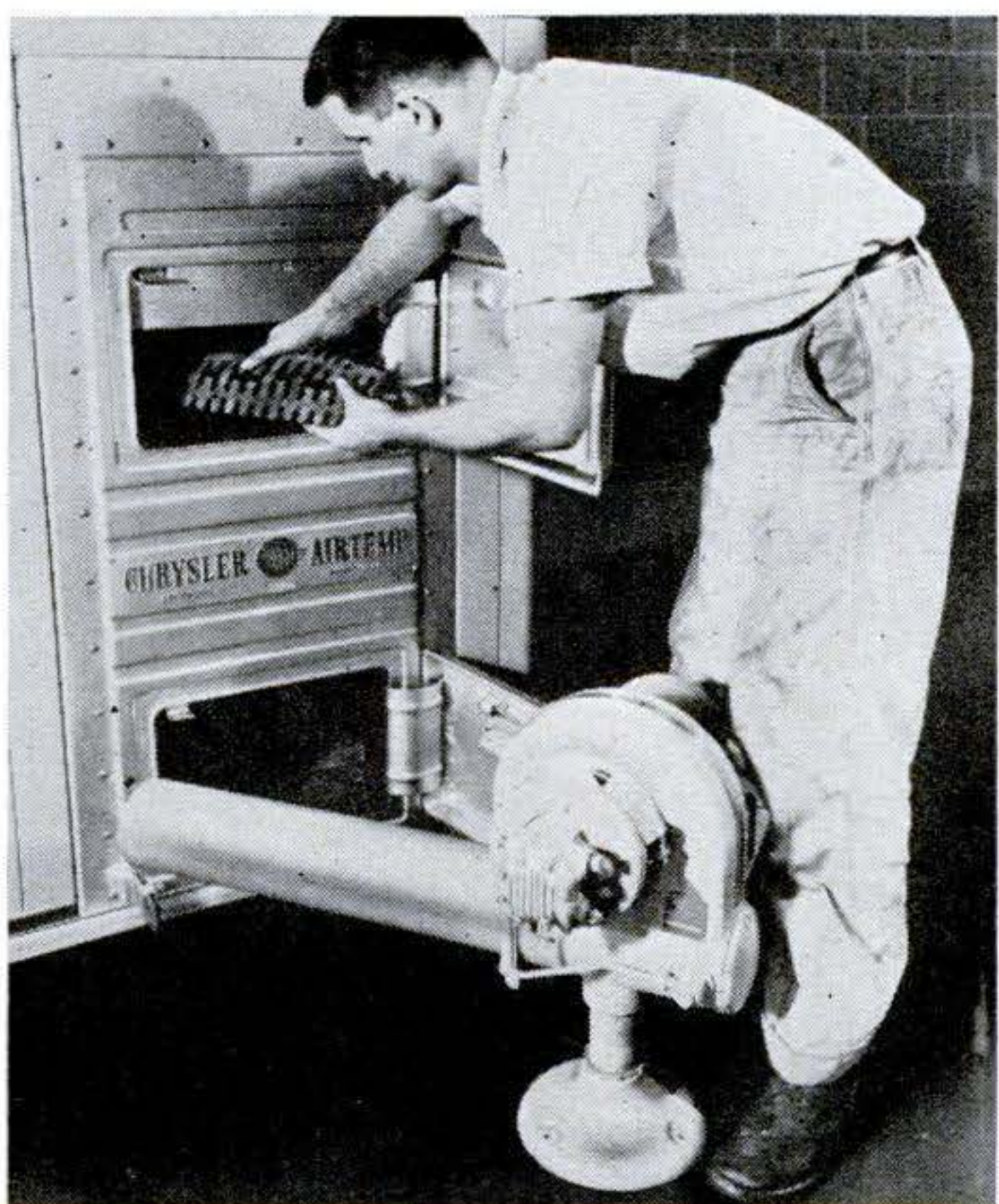
Oil or coal, take your choice. With this new heater, made by Diesel Oil Burner Corp., you change from one fuel to the other in a matter of minutes. Note coal-feed door on the side.

introduced by Norman Products Company, of Columbus, Ohio. This unit automatically switches back and forth between oil and gas, depending on the temperature outside your home.

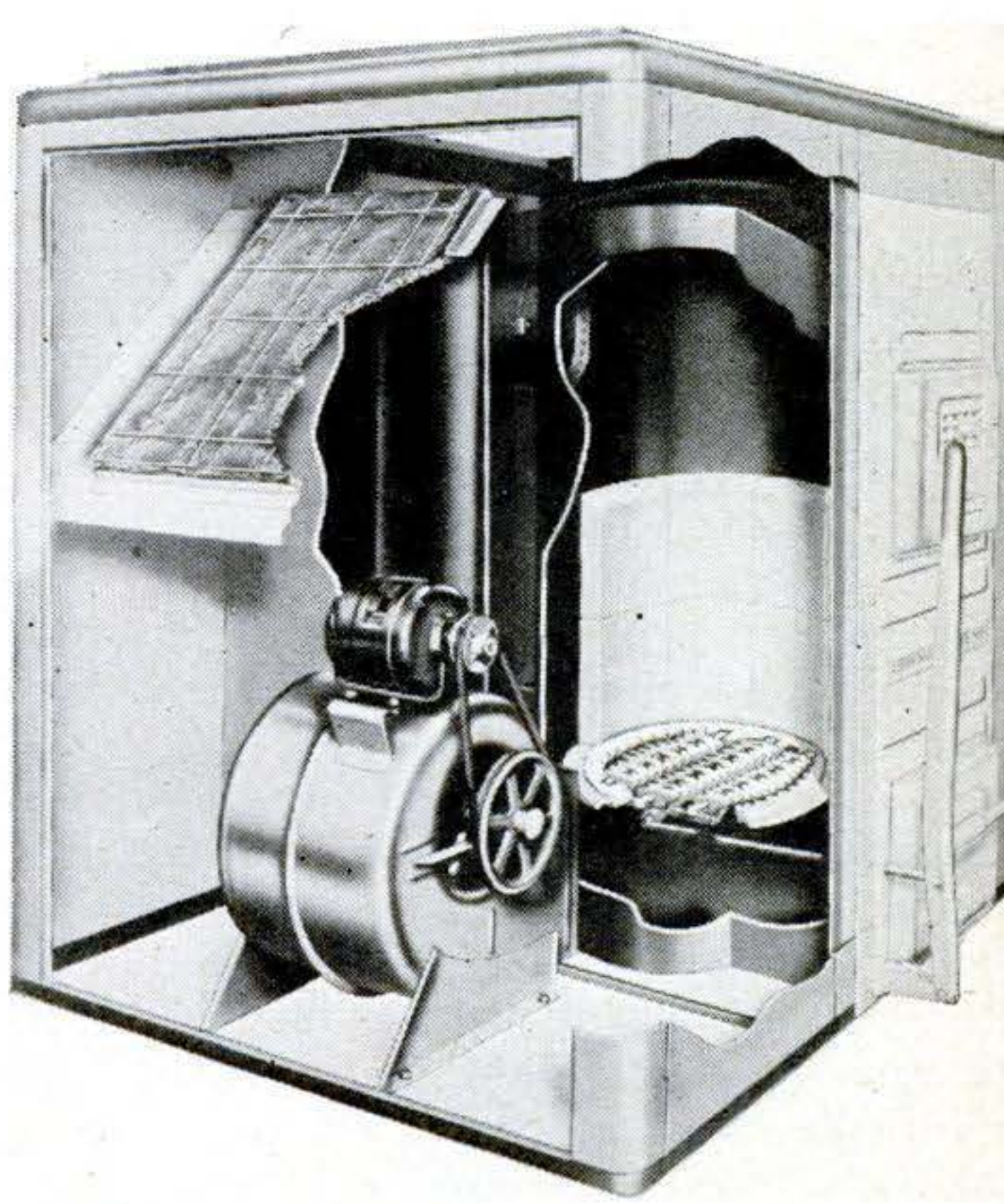


A switch makes the change. This manual lever prevents use of oil and coal equipment at the same time. When the coal damper is opened, a switch automatically cuts off oil burner.

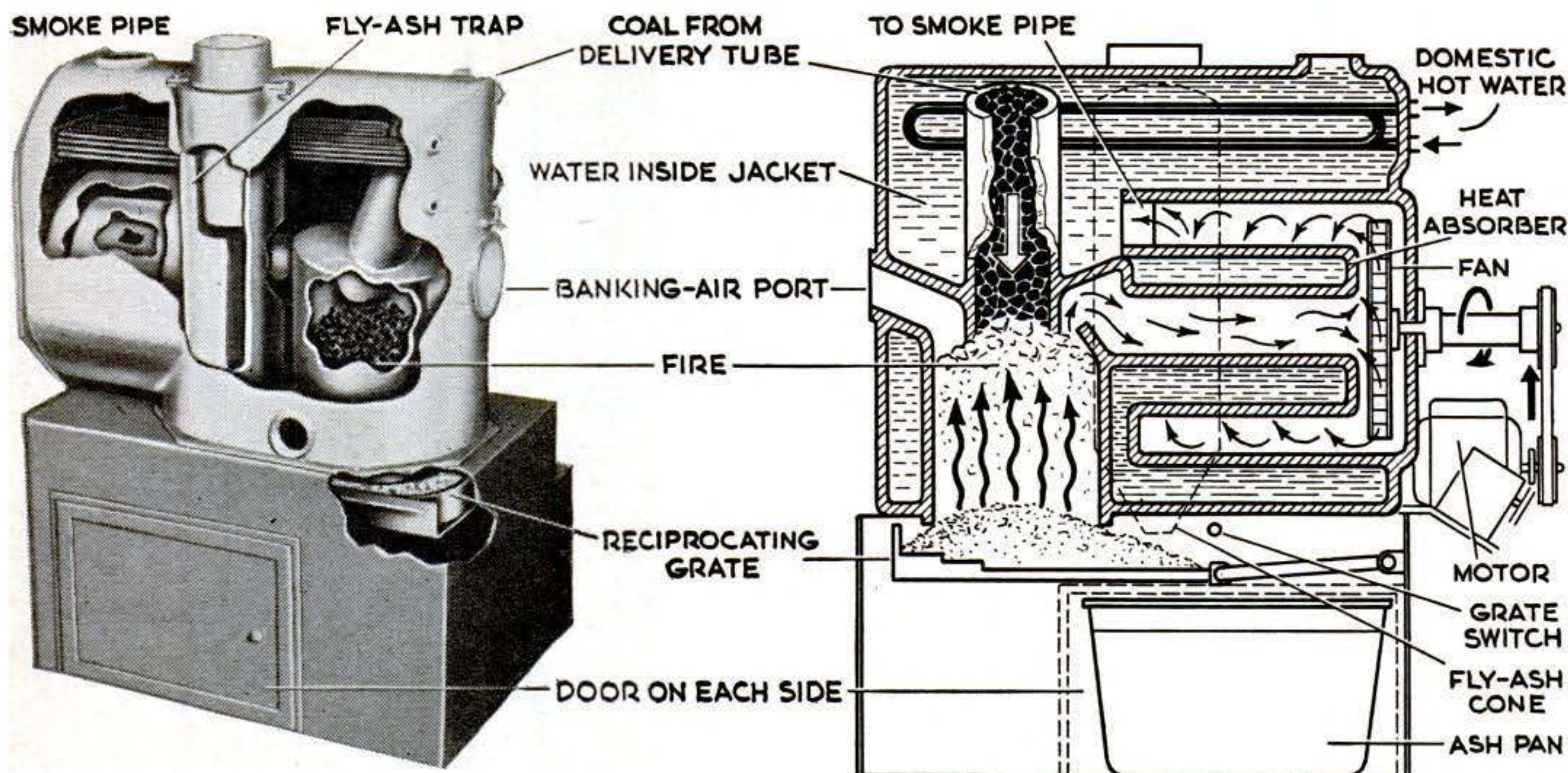
Ordinarily, it burns gas. But when the temperature drops to a predetermined point, a thermostat mounted outside the house shuts off the gas and feeds oil instead. The changeover point is slightly above the



Grates are easily removed from the Chrysler Airtemp® if you want to shift from coal to oil. Sheet metal is placed around oil burner to close furnace. Ash door is stored away.



A blower and air filter are seen in cut-away view of Chrysler Airtemp. An optional feature, the blower-filter unit increases the heating efficiency of this hot-air furnace.



You can now buy the Anthratube. Commercial unit above is made by Axeman-Anderson Co., Williamsport, Pa. Developed by the hard-

coal trade association (PS, Dec. '46, p. 152), the Anthratube burns anthracite by forced draft. A revolving screw (not shown) feeds the coal.

temperature where the gas company's peak load occurs—the time when everyone is using gas and there may not be enough to go around. When the cold snap is over, the unit switches back to gas.

Gun-type oil burners are being made more efficient, particularly in respect to their ability to burn the new catalytic oils that you now sometimes get instead of the thermally cracked oil of former years. This is important to you since the catalytic stock is usually more economical to buy.

The trend here is toward greater turbulence in the air that's mixed with the oil. Among the leaders in this respect are Norge and the Richfield Manufacturing Co., of Baldwin, N. Y. Norge is marketing a Whirlator Head® and Richfield a Turbulator Head®. Both of these are said to break up the oil into finer particles.

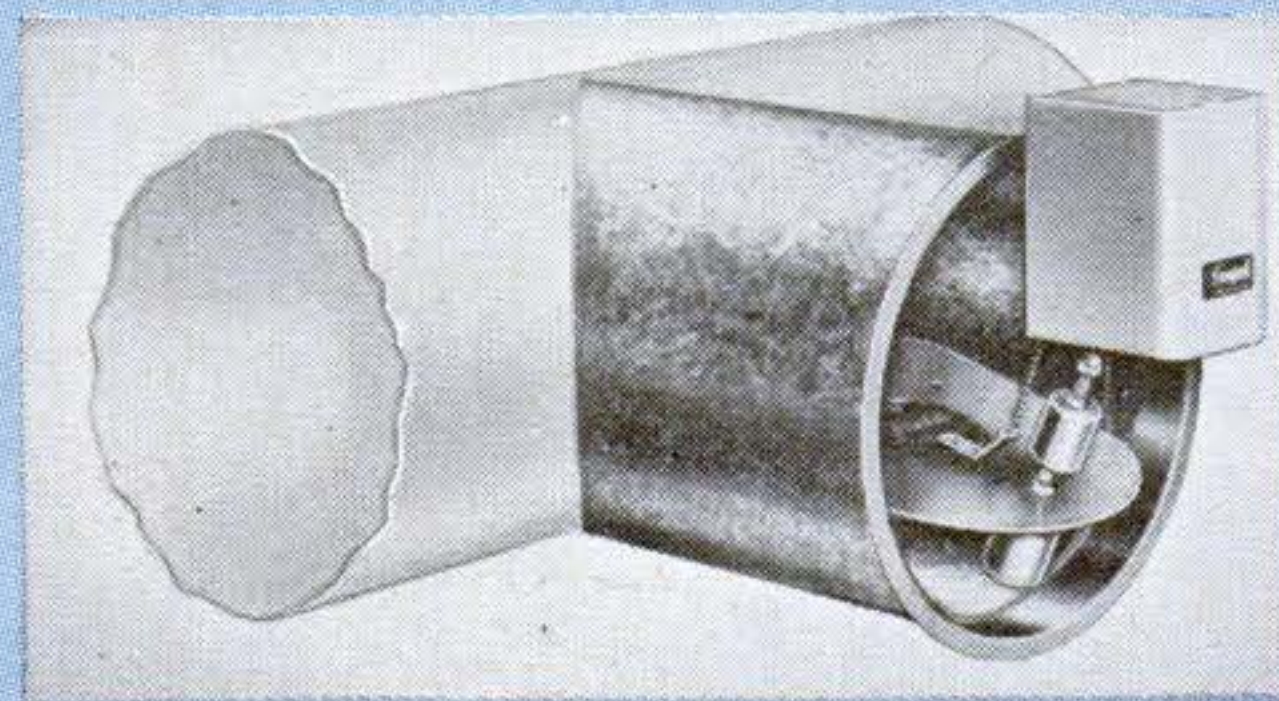
Space saving is an aim of some manufacturers, and new heaters in general are more compact than a few years ago. Unique in the space-saving field is a warm-air oil furnace that's hidden in a 25" by 25" chimney. Made by Chimney Furnace Corporation, Rockville, Md., it utilizes the heat that often escapes up the chimney. An accompanying sketch shows its operation. A fan drives air down along a heated pipe.

This furnace can be used in either a basement or no-basement home, but it's limited to new construction because a special chimney is required. The chimney must be inside the house to prevent heat loss. **END**

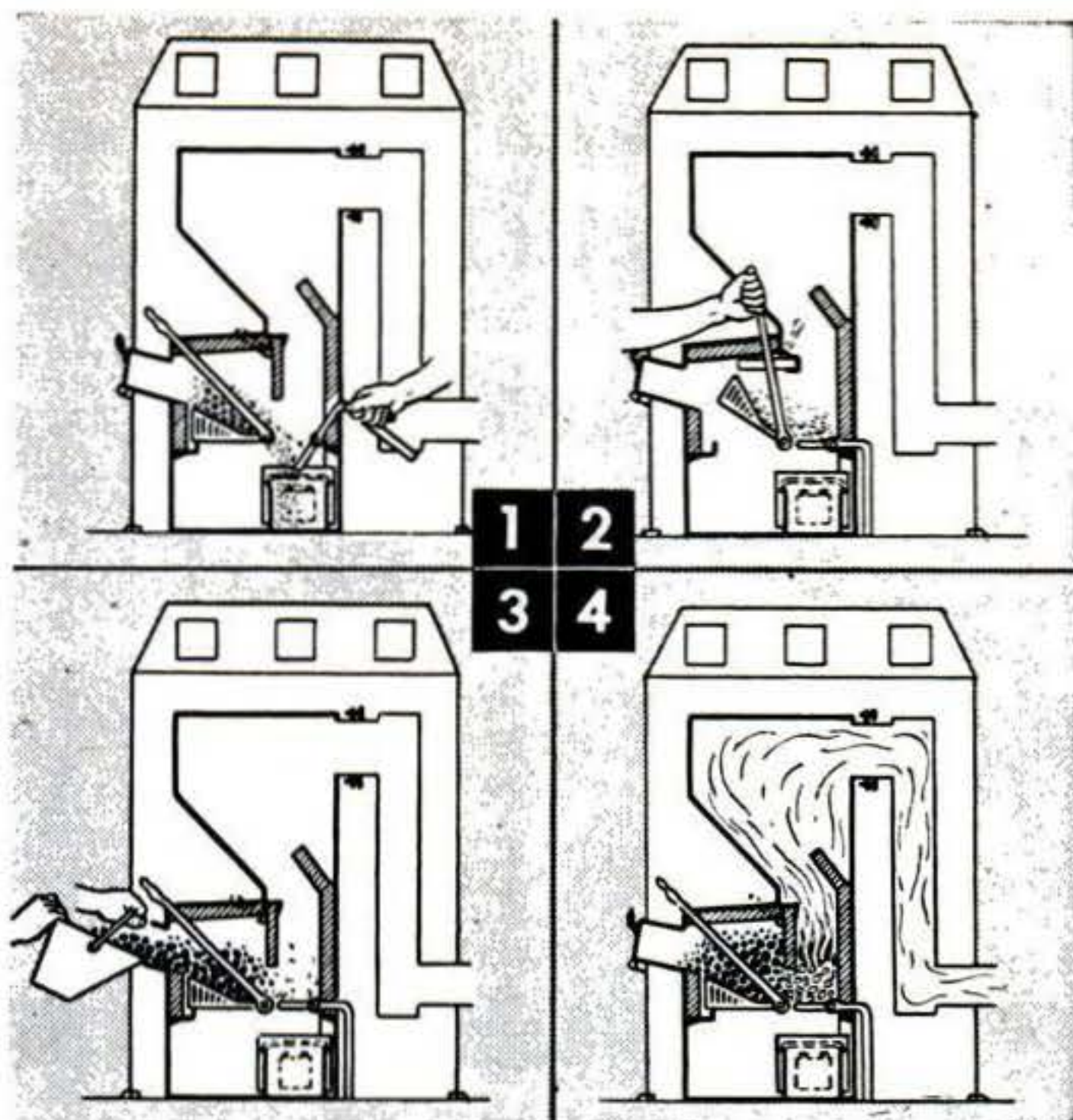
New Heating Accessories Stretch Your Fuel Dollars



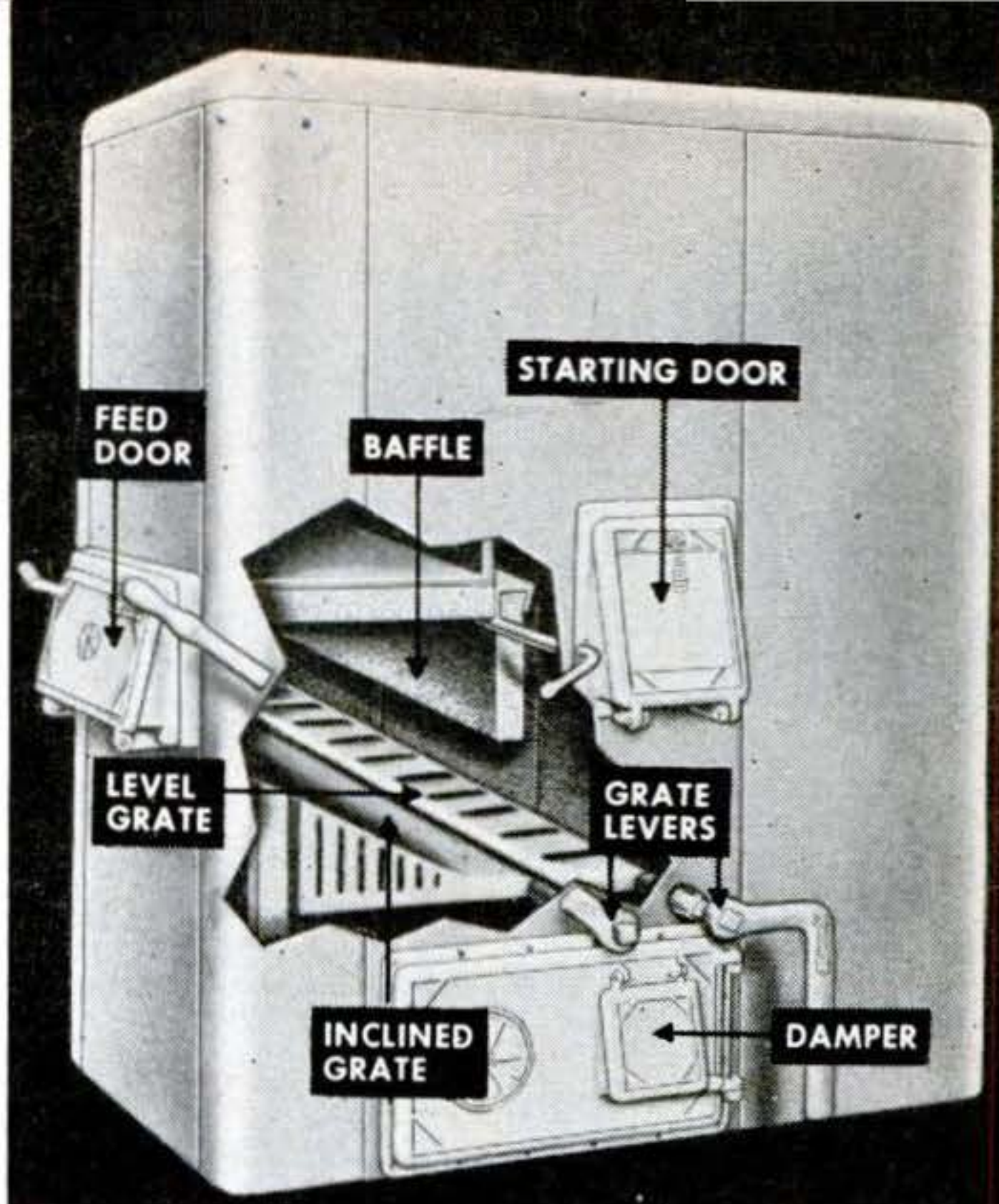
Thermo-Matic Registers® made by Dole Valve Co., Chicago, regulate heat input to each room. An easily-set thermostat keeps the room at desired temperature.



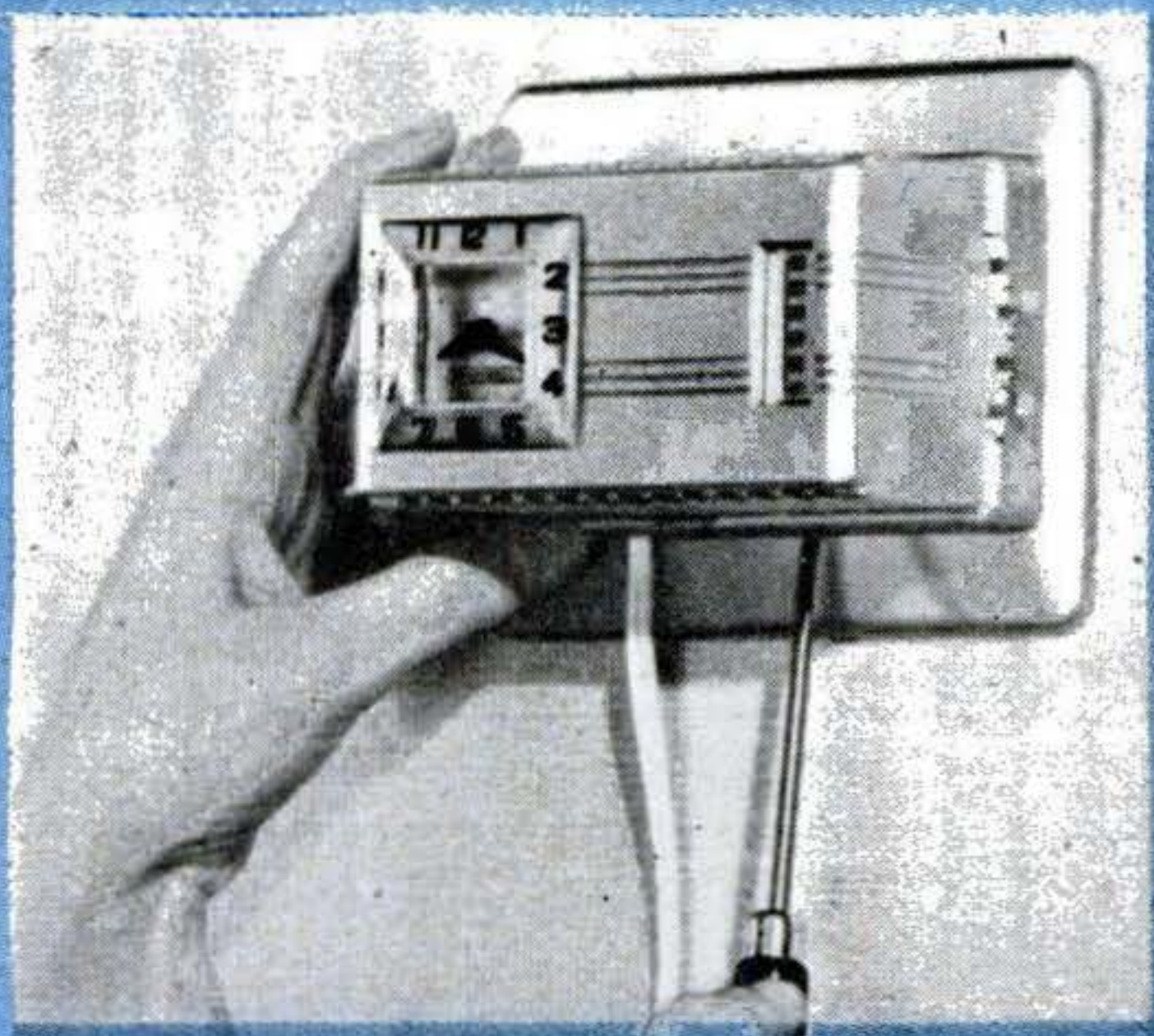
Sequence Control® opens flue after oil burner stops, keeping chimney draft from wasting heat. Operated by the thermostat, it closes flue before burner turns on. Sampsel, Spring Valley, Ill., makes it.



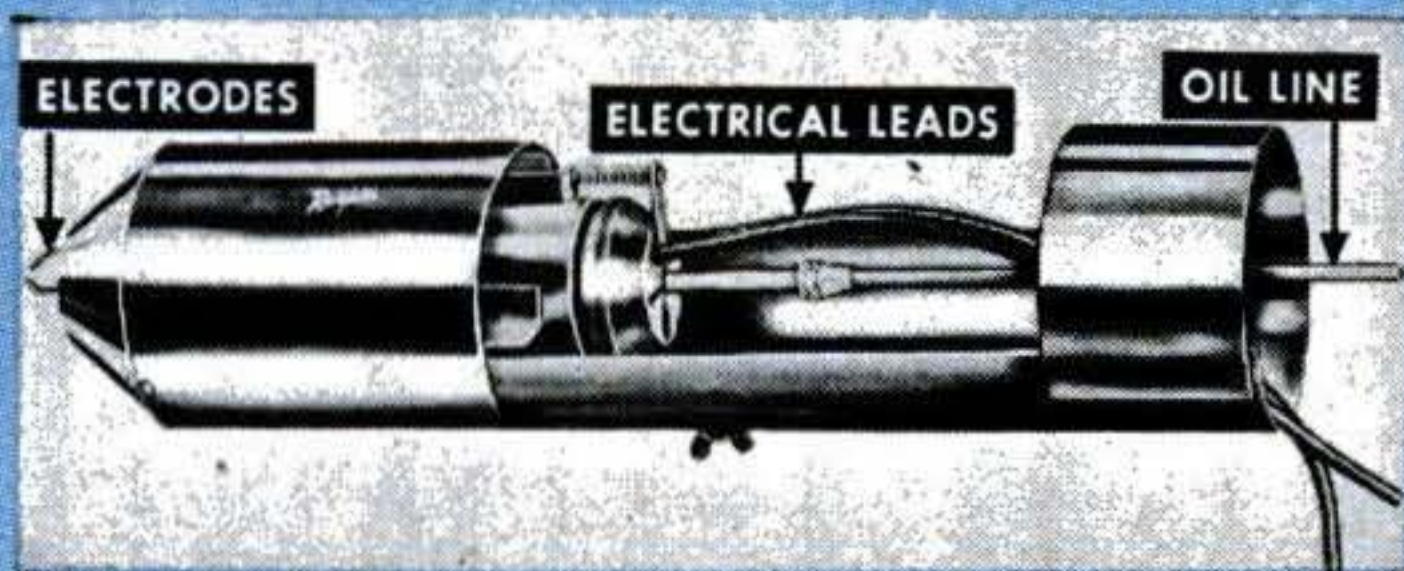
Soft coal is first coked and then consumed in a bank-firing heater made by the Worsham Co., St. Louis, Mo. With the fire going, ashes are



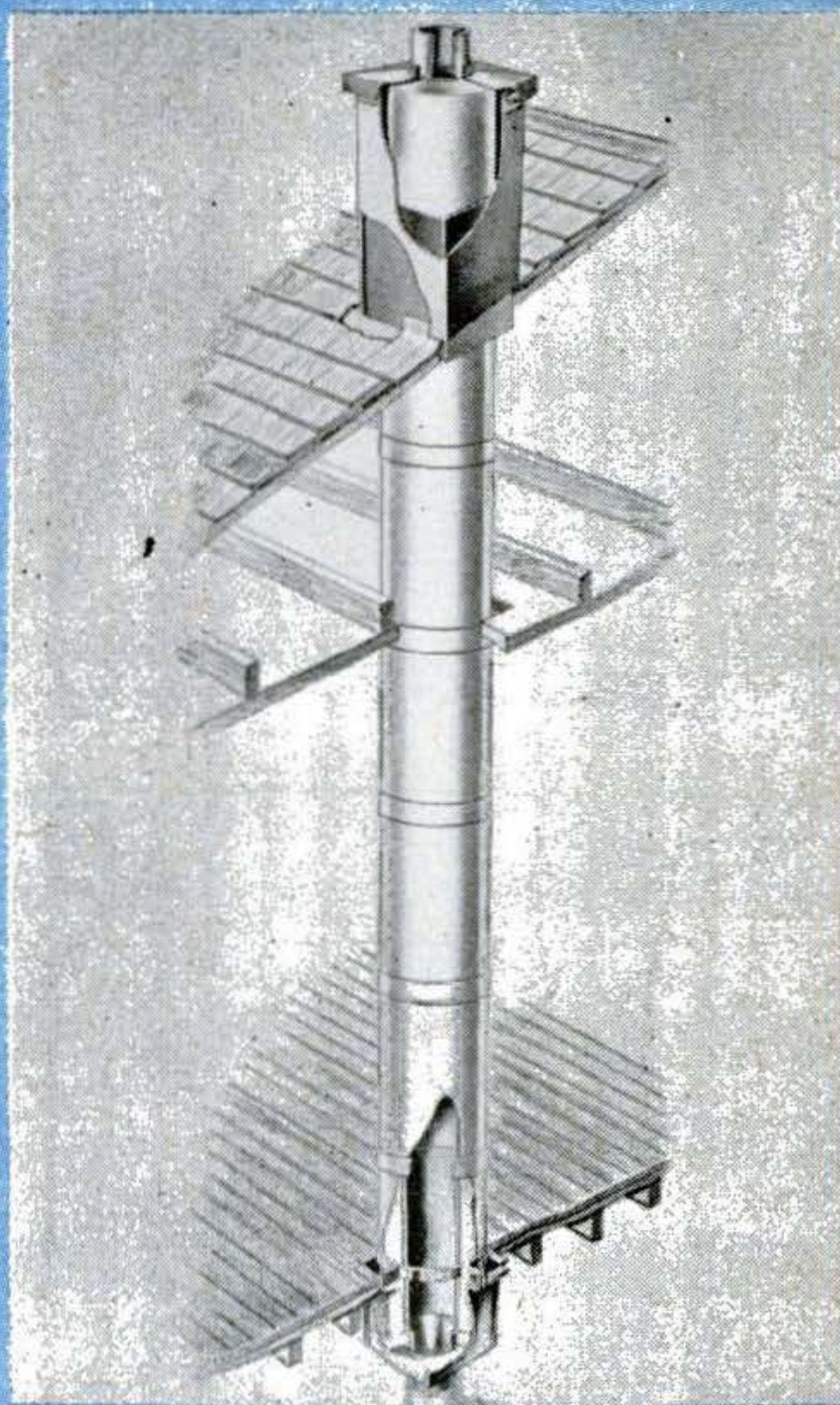
dumped from level grate (1). Tipping inclined grate (2) moves hot coke to level grate. Coal is added (3). Latter cokes as other burns (4).



Clock thermostat made by Honeywell is quickly installed. It requires no transformer, since the clock uses a 115-volt motor instead of the 24-volt motor that's found in some others.



Turbulator Head® for gun-type oil burners is made by Richfield Mfg. Co., Baldwin, N. Y. It gives the swirl and turbulence needed to mix air and fine oil particles, enabling you to burn new catalytic fuel oils efficiently.



Aluminum chimney marketed by Van-Packer Corp., Chicago, is so light that floor will support it, making foundation unnecessary. It can be installed in a few hours and costs half as much as brick.

5009

Grooving and Rabbeting with Woodworking Machines

With common power tools, accurately cut dados, rabbets, and grooves are only minutes in the making.

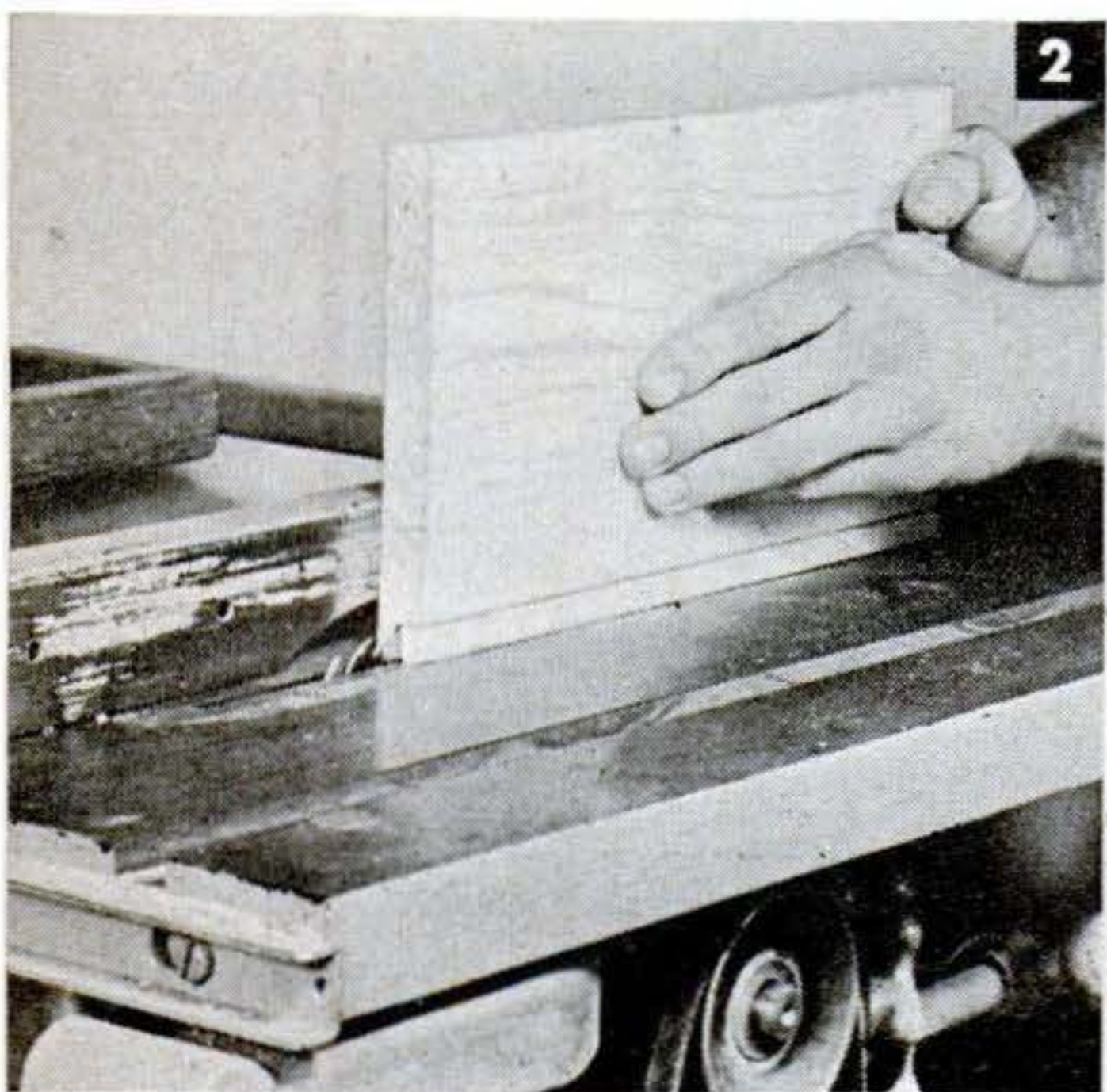
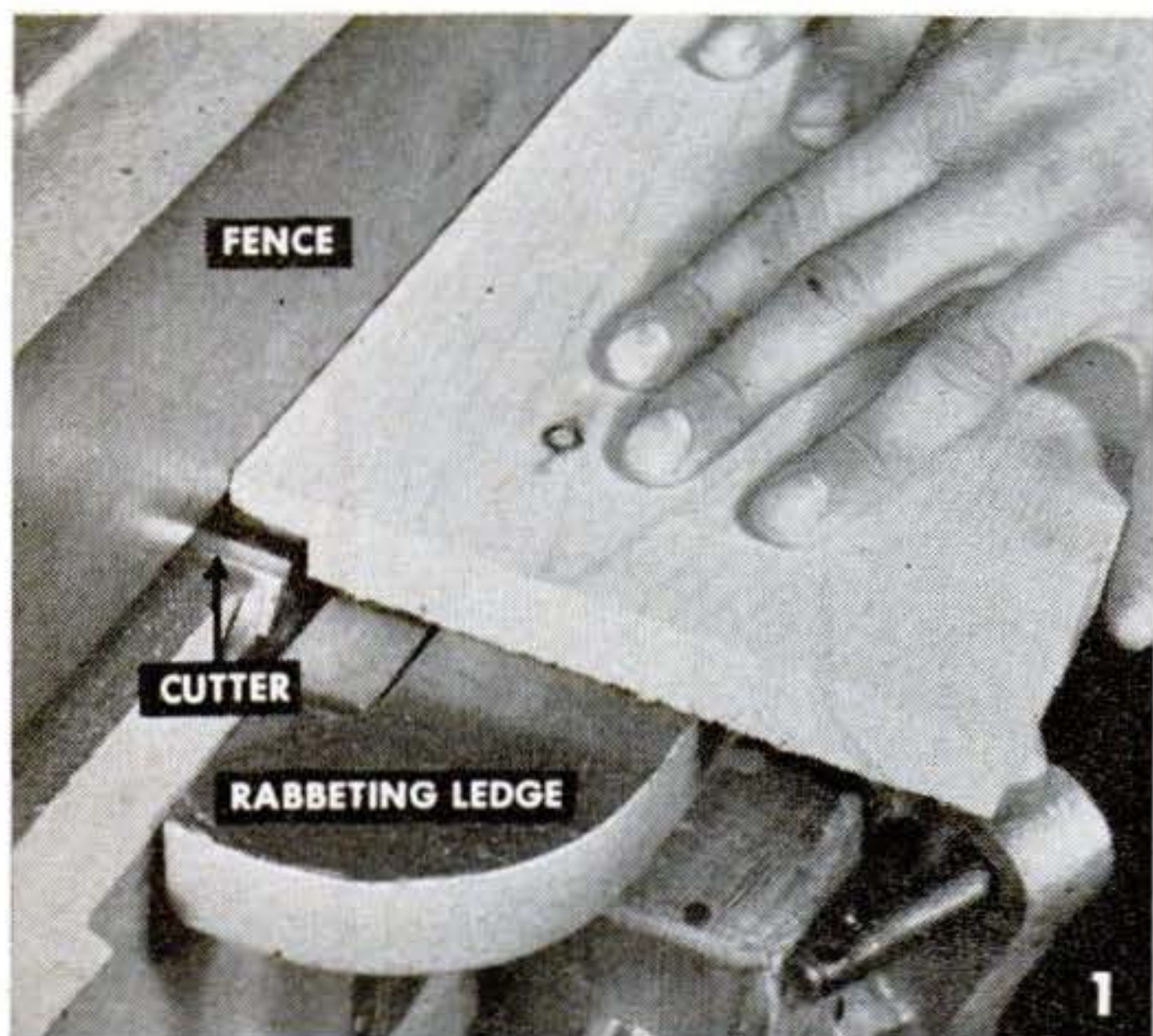
By Edwin M. Love

LIKE everyone else, the woodworker has to strike a balance between what he puts into his craft and what he takes out. The price of fine work is skill, time, and effort; his judgment tells him how much of the last two to spend on any given project.

As was pointed out last month, grooves, dados, rabbets, and the like have many applications in cabinetry. When they have to be made with hand tools, you first want to consider whether the extra strength and neatness of the finished job make the extra work worthwhile.

With power tools these operations are so simplified that there is rarely any need to forego their advantages. Woodworking machines not only reduce the time and effort involved in doing the job, but they also save the worker hours of practice that would be needed to become expert in the use of hand tools.

A jointer is one of the most convenient machines for rabbeting. It has a projecting ledge or shelf on the edge of the infeed table which supports the work. Slide the jointer fence to the right until the cutters project the width of the rabbet desired. For very accurate work, make test cuts in scrap. Press the board firmly against the fence and table as shown in Fig. 1, and feed it over the blades. Note that the guard can't be used in this setup, so it's up to you to take extra precautions for your own safety. Most



rabbets will be made in one pass, but two or more may be better in cross-grained or very hard wood.

On rare occasions you may have to make a narrow rabbet that is deeper (measured from a face) than the maximum depth of cut the machine can handle. In such cases, stand the board on edge as in jointing. By this method the depth of the rabbet will be limited only by the width of the cutter.

A jointer is sometimes used to rabbet the end of a board, but unless you have a holding jig, don't try it on a piece less than 5" wide. The method is essentially the same as edge rabbeting. Take special pains to hold the board level. Feed it in slowly, especially near the end of the cut, to prevent splintering of the rear edge as the cutters break through.

Many carpenters prefer the circular saw for rabbeting. It will make larger rabbets than almost any other tool. Two cuts are taken with an ordinary combination blade. Set the machine as for ripping, allowing the blade to project above the table by an amount equal to the depth of the rabbet. Cut into the face of the board. Set the fence again and saw the adjacent side of the rabbet as shown in Fig. 2. If the rabbet is to be square in section, you can save time by leaving the fence setting unchanged and sliding the rabbeted face against the fence for the second cut. While this imprisons the waste stock between the board and the fence, it gives added safety by keeping the blade behind the work.

A drill press equipped with a rotary planer is an efficient tool for making shallow rabbets. Set the machine as for planing, adjust

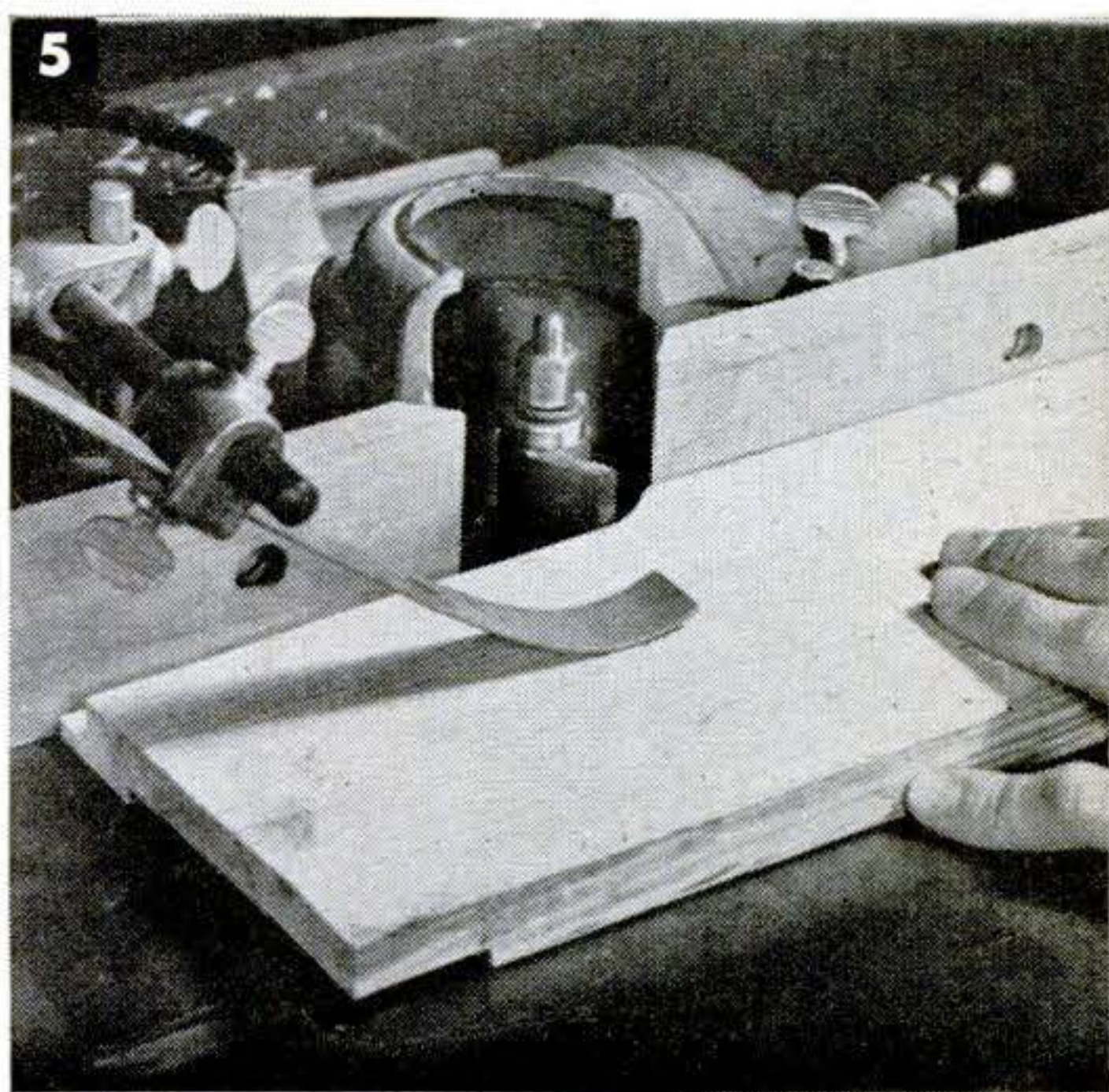
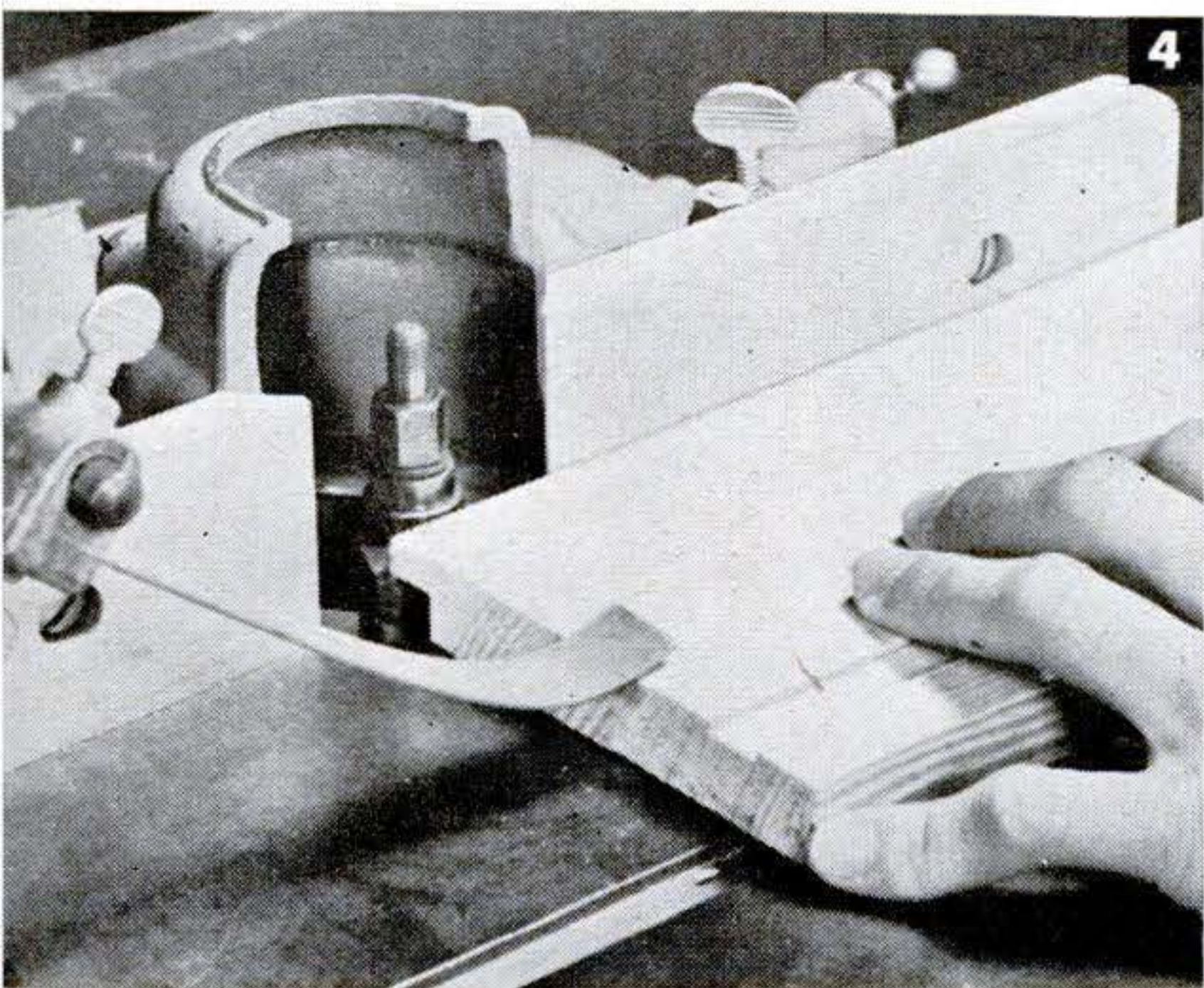
the fence for the correct width (this may have to be done by taking a test cut in scrap stock), and plane out the rabbet as pictured in Fig. 3. An end rabbet is shown here, but the technique is exactly the same for an edge cut. If greater width is required, simply shift the fence and make two or more passes.

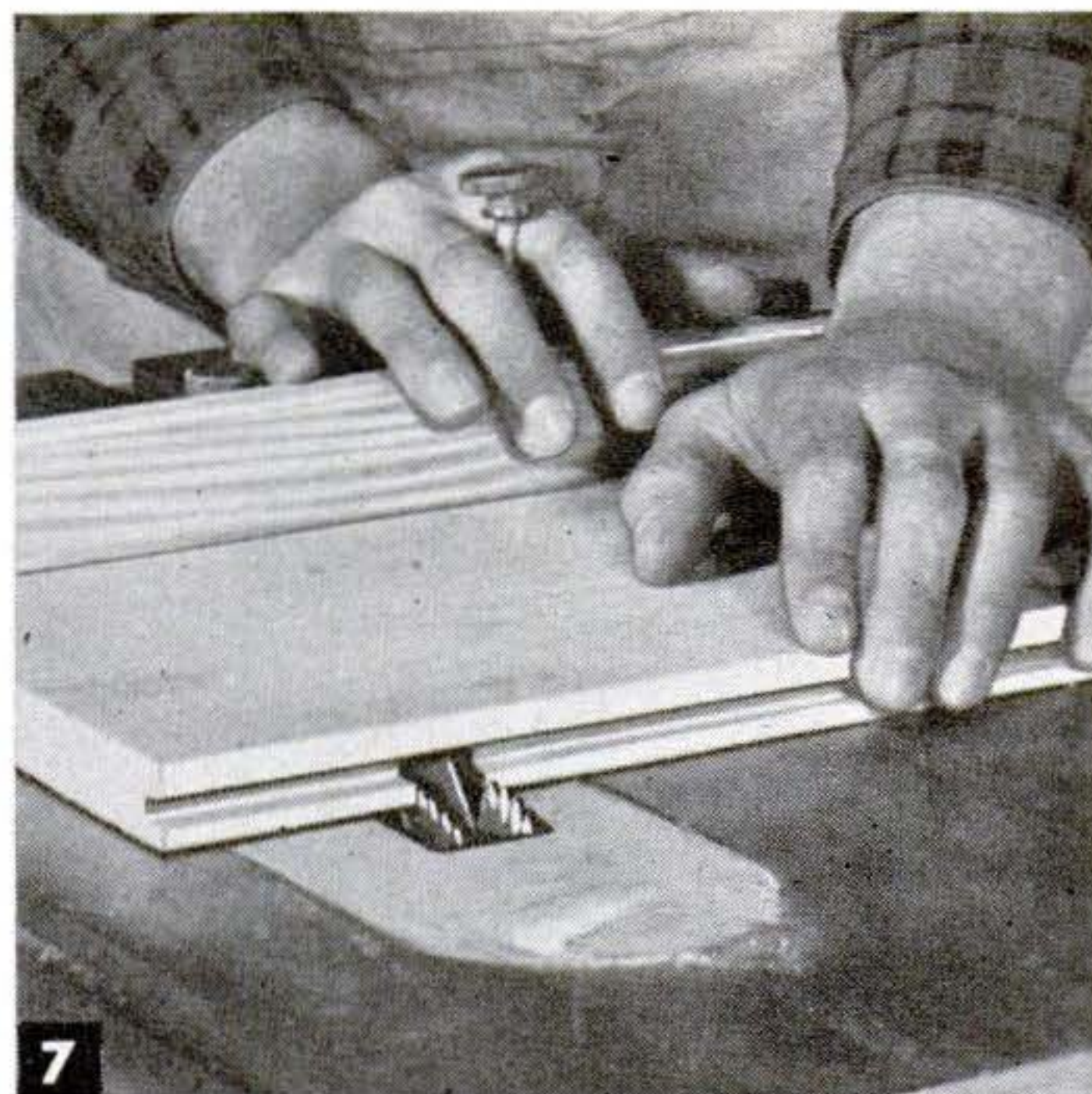
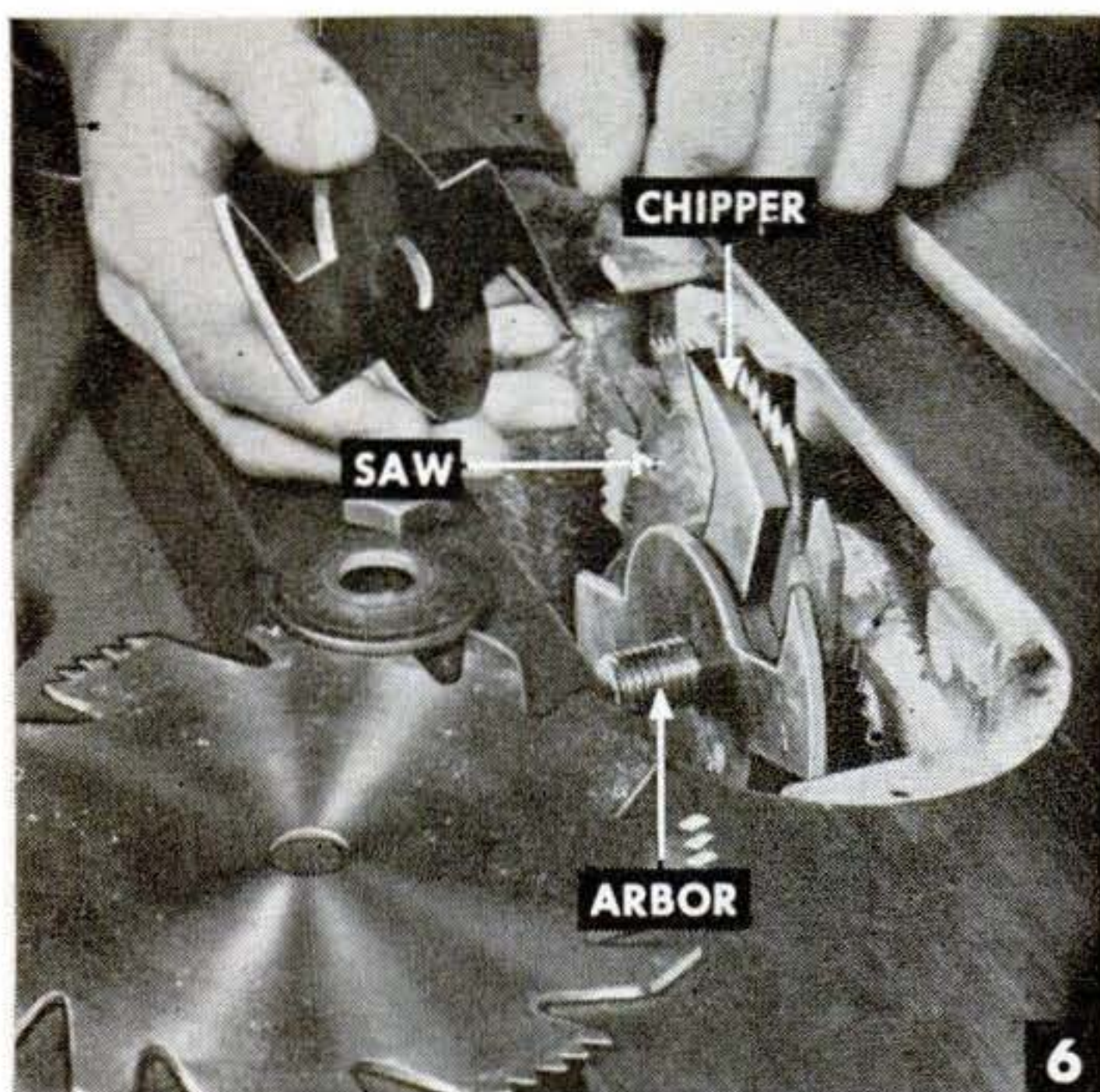
The versatile shaper rates high in cutting rabbets. Mount a straight-edged cutter on the spindle and clamp the fence where it will allow the knives to cut to the required depth. The fence faces must be set in a straight line. A rabbet can be cut on the upper or lower side, according to circumstances. If below, as in Fig. 4, the cutter will be hidden by the work. This is a valuable safety feature; it also insures that—regardless of thickness variations in the lumber—the rabbet will be uniform on all pieces processed at the same setting.

Sometimes the important dimension is the thickness of the tongue rather than the depth of the rabbet. In such cases, set the cutter above, as in Fig. 5. Then the tongue will always be uniform regardless of other variations.

In all cases feed the work against rotation of the blades. If the shaper is reversible, favor the grain by cutting with it whenever possible. Use mechanical hold-downs for greatest safety.

Making a dado is a fairly involved task with hand tools, but it's a single-pass job on a circular saw equipped with a dado head (Fig. 6). A dado $\frac{1}{8}$ " wide calls for one saw blade; two are required for a $\frac{1}{4}$ " cut. Wider ones are made by sandwiching "chippers" between the blades. The cutting edges of the chippers are placed at the openings be-





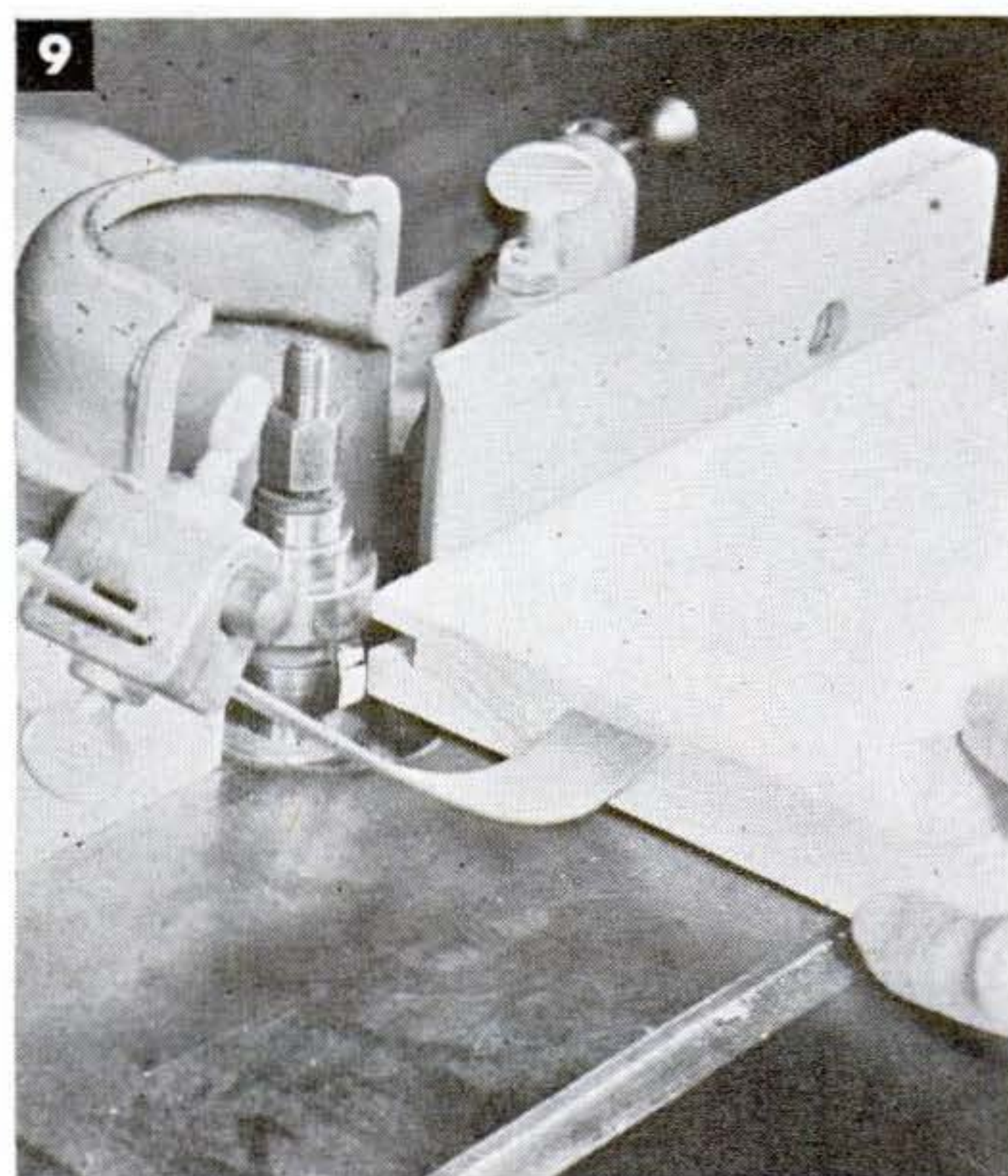
tween the saw tooth groups. Dadoes of varying width can be made by using different combinations of inside cutters. Add paper washers for fine adjustments.

A dado is usually cut as shown in Fig. 7. The miter gauge is used to keep the workpiece exactly at right angles with the blades. Note the wooden auxiliary fence that is screwed to the miter gauge. It supports the back edge of the work and prevents splintering, while giving a substantial base for long pieces.

Grooves made lengthwise of the lumber are cut in an operation similar to ripping, but using a dado head. For edge grooving, slide the board on edge with one face against

the fence. Grooves can also be made with a "wobble" saw, which is an ordinary blade that is set at an angle with the arbor. A pair of washers thinned at one end cause the saw to run out of true. The extra side swing cuts a kerf wider than normal. Tapered washers can be made of plywood, or you can buy a set of steel ones calibrated to show the amount of wobble. The edges of a groove or dado cut with a wobble saw will be angled unless it is made in a series of shallow cuts.

A blind dado is made by stopping the forward motion of the wood before the head cuts through the edge. Clamping a block to the table will limit the stroke accurately



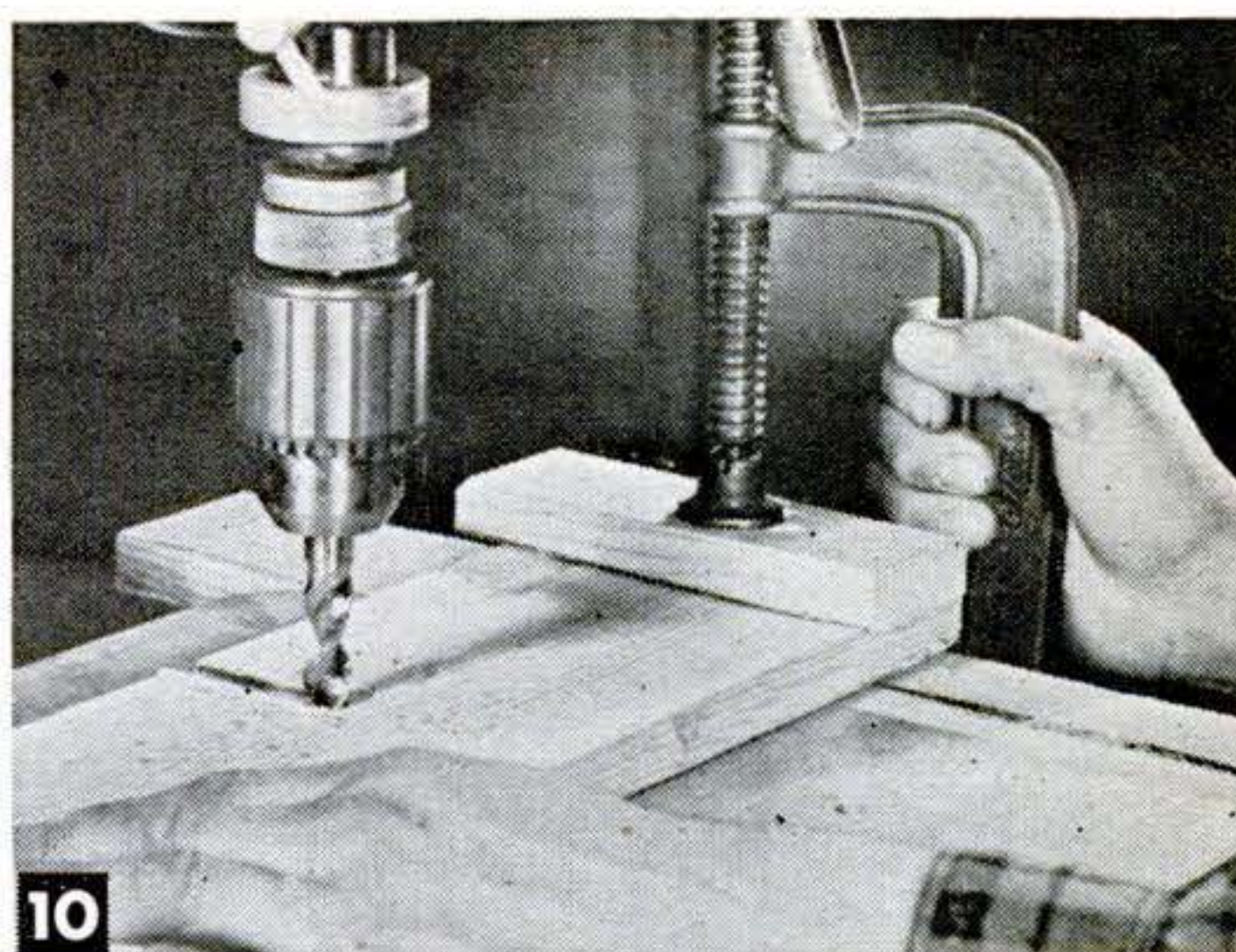
and automatically. If both ends of a dado are to be left blind, clamp a starting block where it will prevent kickback of the piece as it is lowered over the cutters. When necessary, the ends can be trimmed square with a chisel.

Blind grooves are made in a similar manner. To handle long stock, screw an auxiliary fence to the regular one and clamp the stop blocks on it.

End rabbeting with a dado head is illustrated in Fig. 8. To make a similar cut along an edge, use a molding head and keep the unwanted section of the head under the arch of the fence. If the regular fence is not arched, attach an auxiliary wooden one that is.

Grooving on a shaper, shown in Fig. 9, is very similar to rabbeting. Use a cutter the same width as the desired groove and raise it above the table as required. The same procedure can be followed when a drill press is used as a shaper.

For face dadoing and grooving, the drill press is used with a router bit held in a solid chuck and run at highest speed. Clamp a strip of wood to the table or use an auxiliary table and fence. Adjust the fence to



bring the router the desired distance from the edge of the piece. Lower the bit for the depth of cut, lock the quill, and feed the work from left to right. If the cut must be made in more than one pass, make all successive cuts in the same direction.

A simple method of guiding the router in dadoing is shown in Fig. 10. Clamp a straight-edged strip to the underside of the board, making it parallel to the dado. Set it so it can slide against the end of the auxiliary table or the edge of the drill-press table, and push the work. **END**

Drill Press and Holder

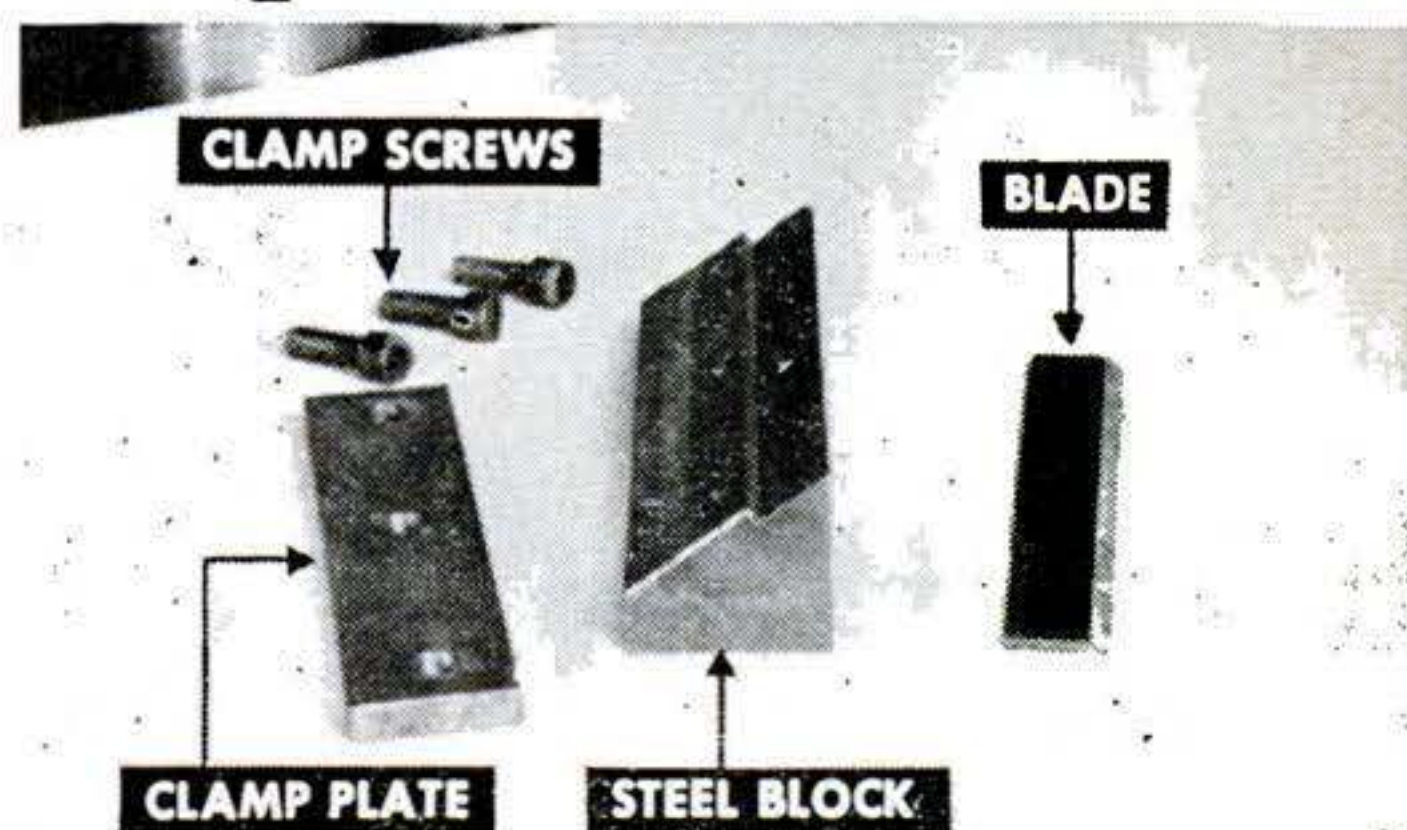


Clamped in this two-piece jig, a jointer blade can be precision sharpened on the drill press.

A STEEL block beveled to the proper angle will enable you to use your drill press for precision sharpening of jointer blades. The jig shown in these photos is used with 4" blades.

Mill or saw the steel block to the correct angle and width. The grinder setup illustrated can be used to finish off the seating surface of a partially finished block. Cut a clamp plate, put it in position, and drill and tap the block for the two or three screws needed to secure the clamp.

Sharpen Jointer Blades



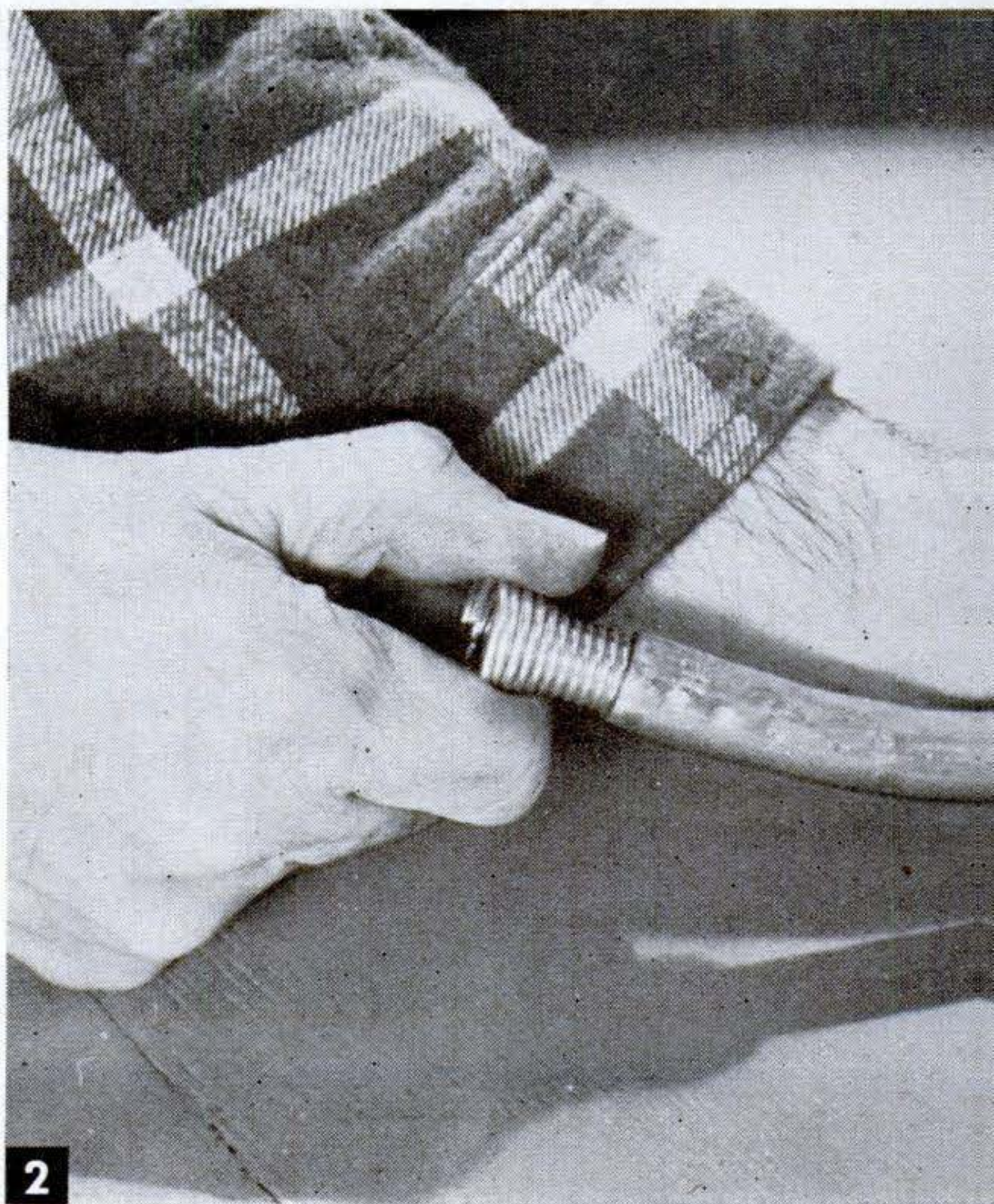
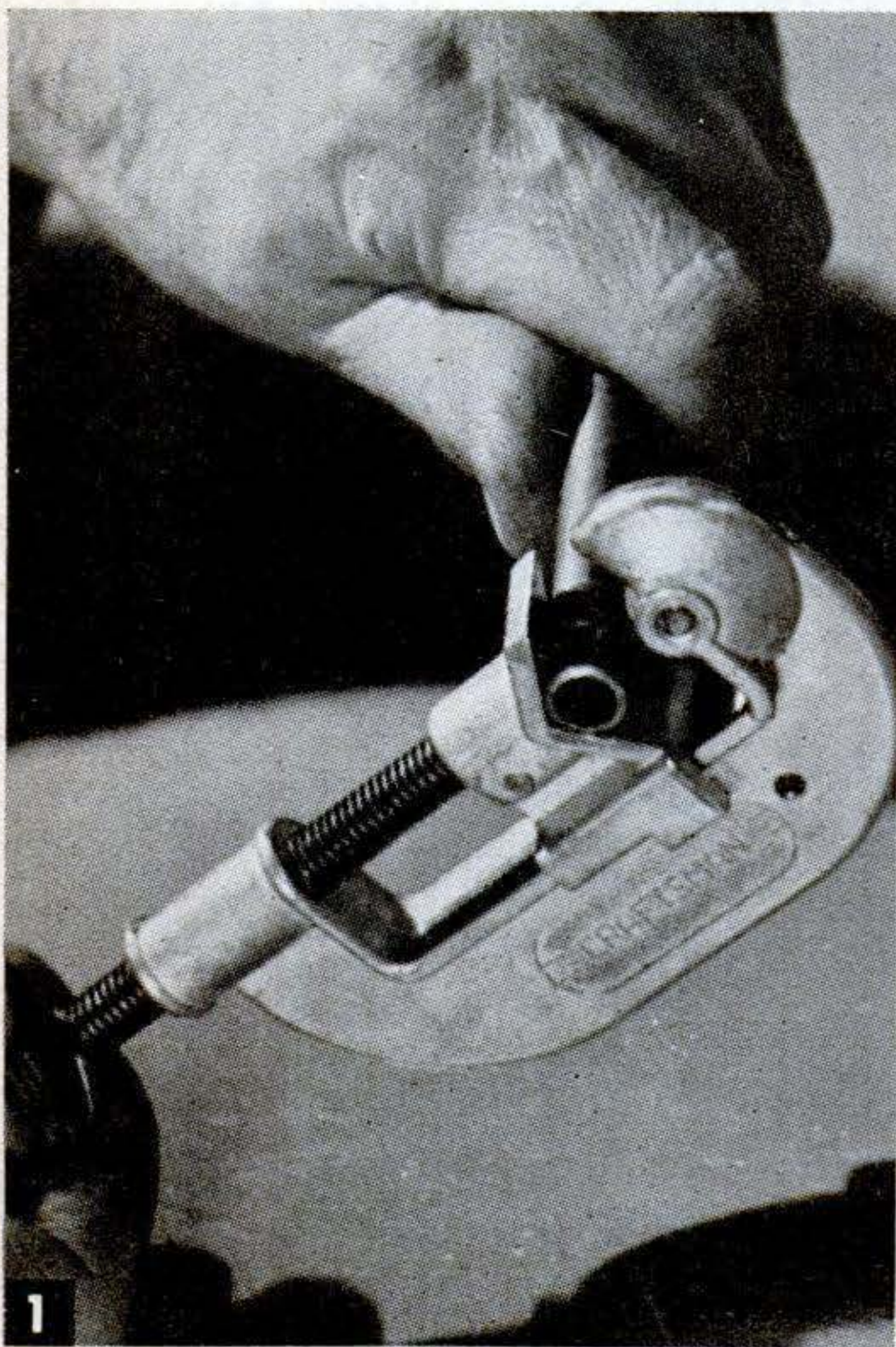
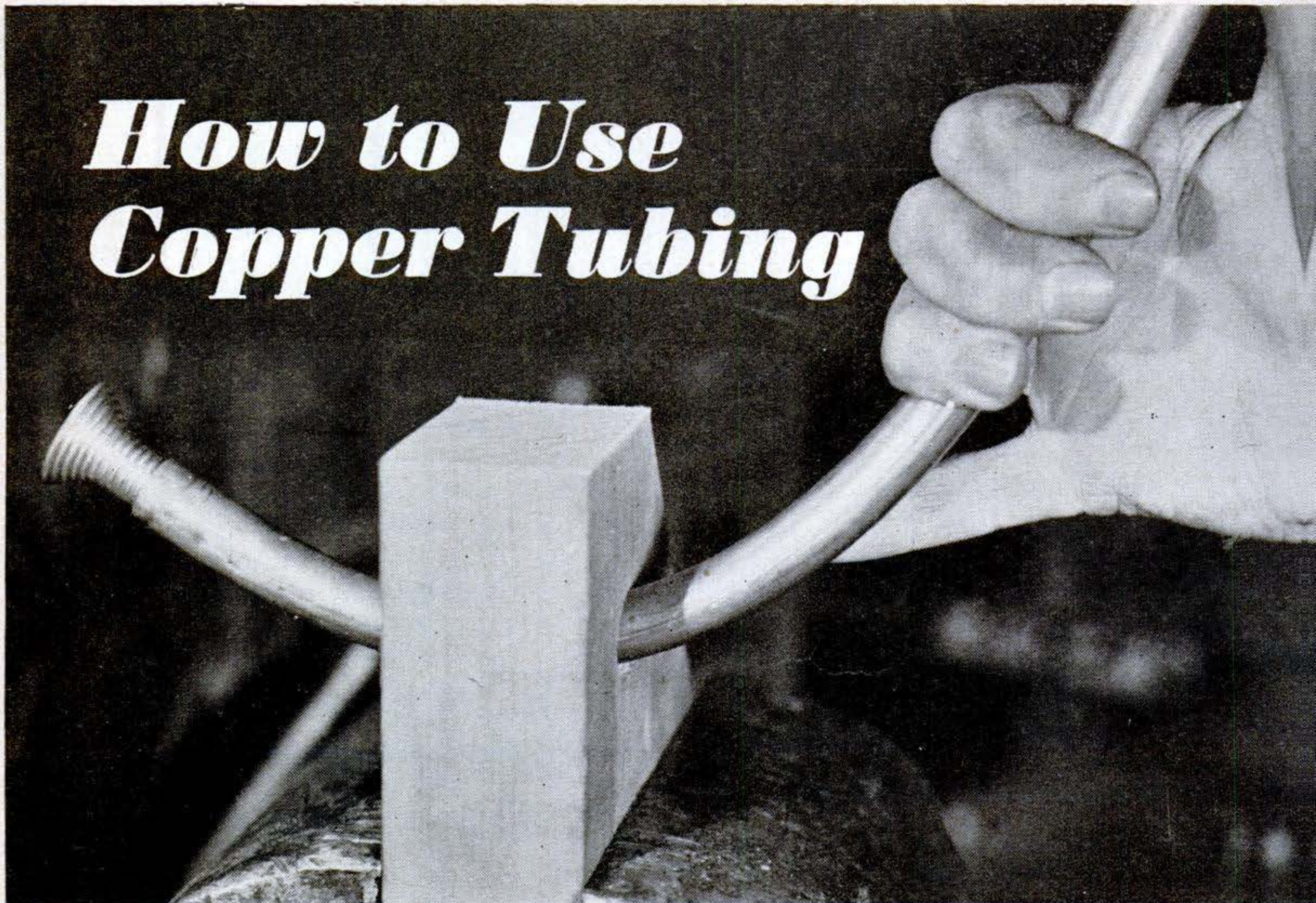
A beveled block, clamp plate, and screws make up the jig. Size and angle should suit blades.

In use the blade is locked in the jig and the cupped grinding wheel—run at 5,200 r.p.m.—is lowered into light contact with the edge. Set the drill-press depth gauge for a light cut.

Hold the jig firmly on the drill table and feed it carefully under the grinder by hand. After each pass the depth-gauge stop screw is backed off slightly to permit another cut. If the final pass is very light, little honing will be required.—E. F. Lindsley, N. Prairie, Wisc.

4476

How to Use Copper Tubing



Fine for refrigerator and auto plumbing, this material has dozens of shop and craftwork uses besides.

By Walter E. Burton

WANT running water in your darkroom? Or cutting oil fed to your lathe? Maybe you have a handmade tray that calls for something special in handles, or want to make a modern small photo frame. For any of these, copper tubing may be the answer.

You can cut tubing with a hacksaw. But this produces ragged edges that have to be squared with a file. If you're going to do a lot of work with tubing, a special cutting tool, as shown in Fig. 1, is preferable. Even such a tool, though it cuts the tubing squarely, sometimes produces burrs. You can buy a deburring tool, but a countersink—the kind used on wood—and a file will be satisfactory. Use the countersink for internal deburring and remove outer burrs with the file.

Copper tubing is easily bent. However, you must take care not to collapse the tube walls. To guard against this, use coil springs or a filler material that can be removed after the bend is made.

Figure 2 shows a set of tube-bending

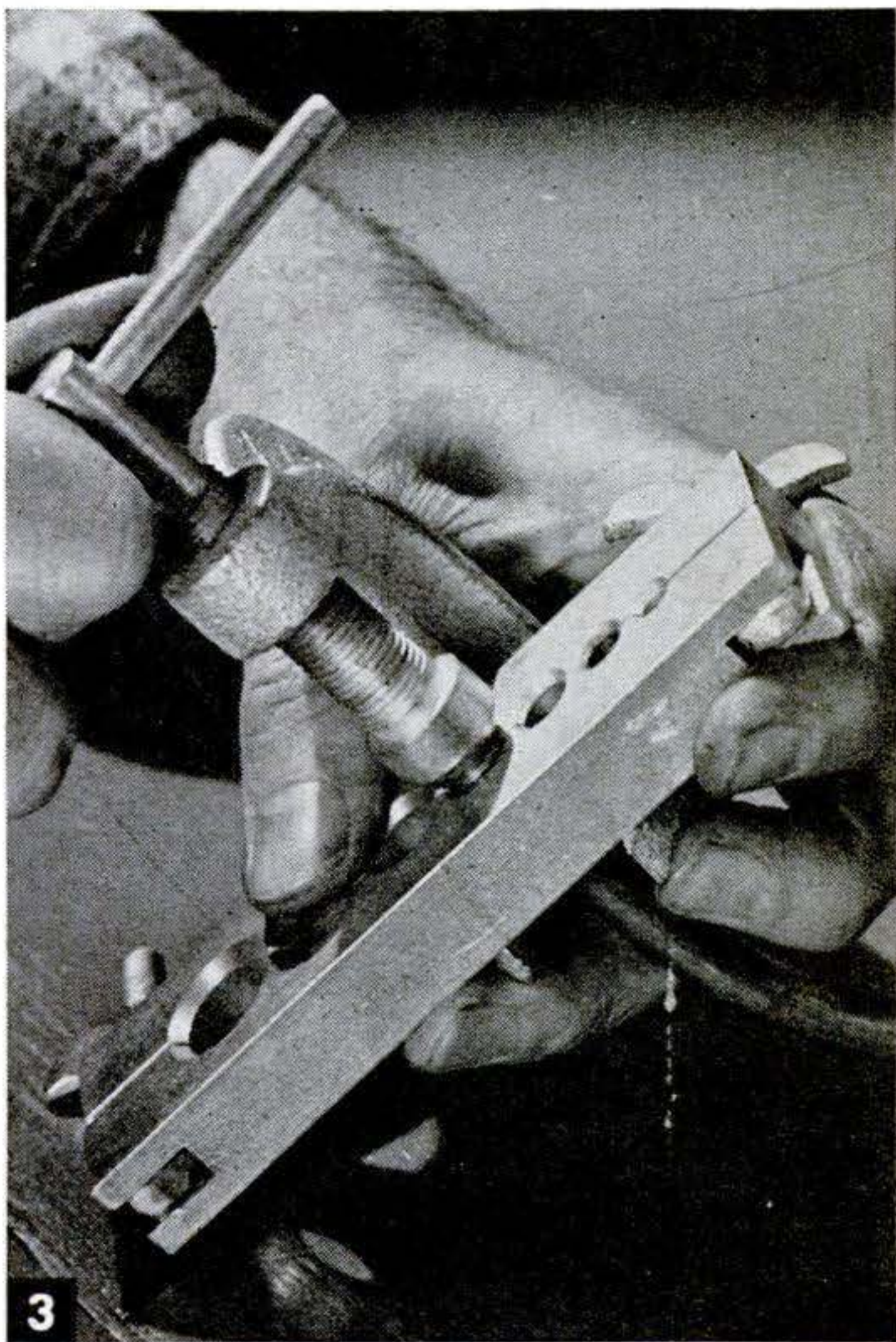
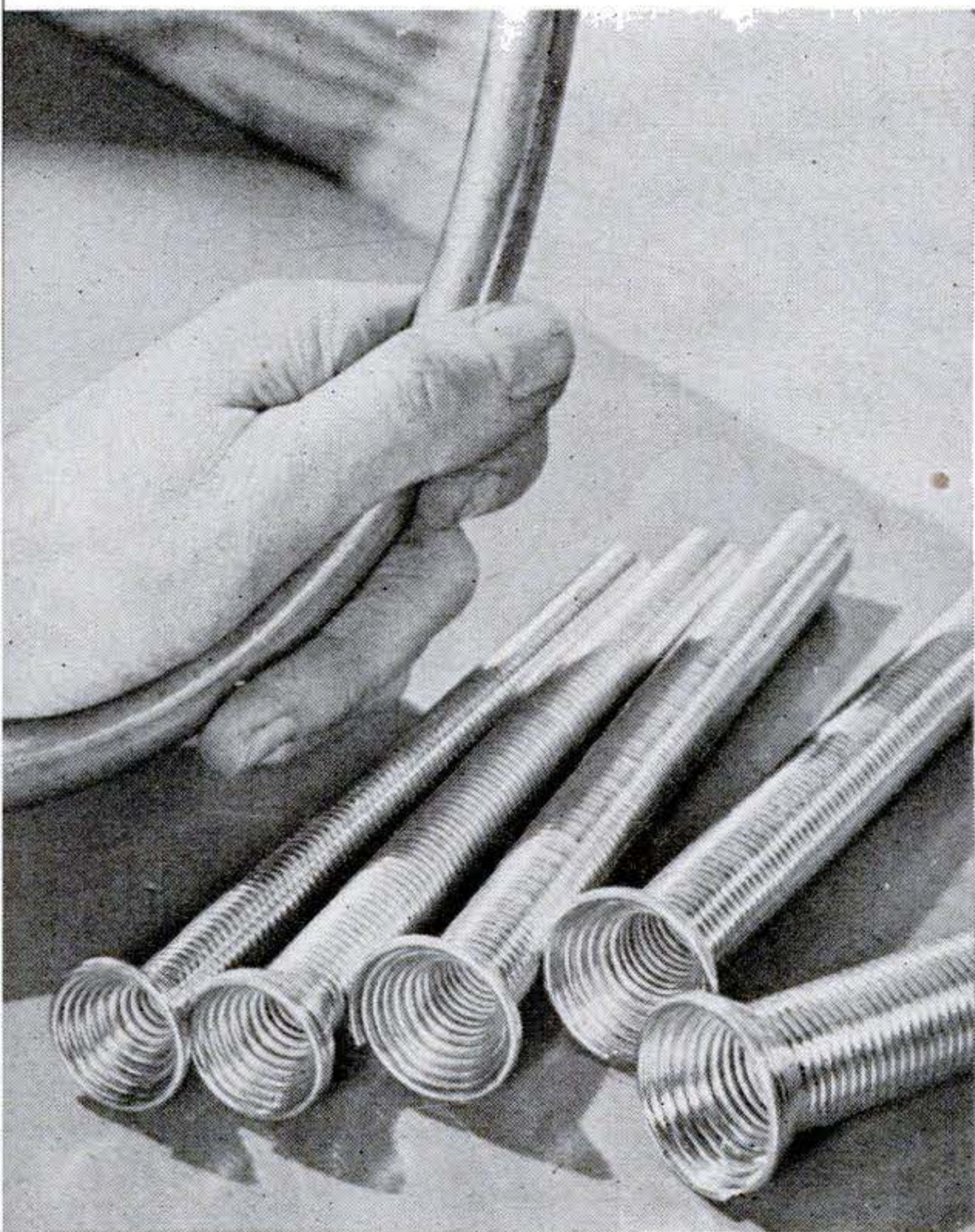
springs you can buy. They're used inside only when the bend does not extend beyond the length of the spring. For bends of greater length, slip a spring over the tube and shift it as you make the curve.

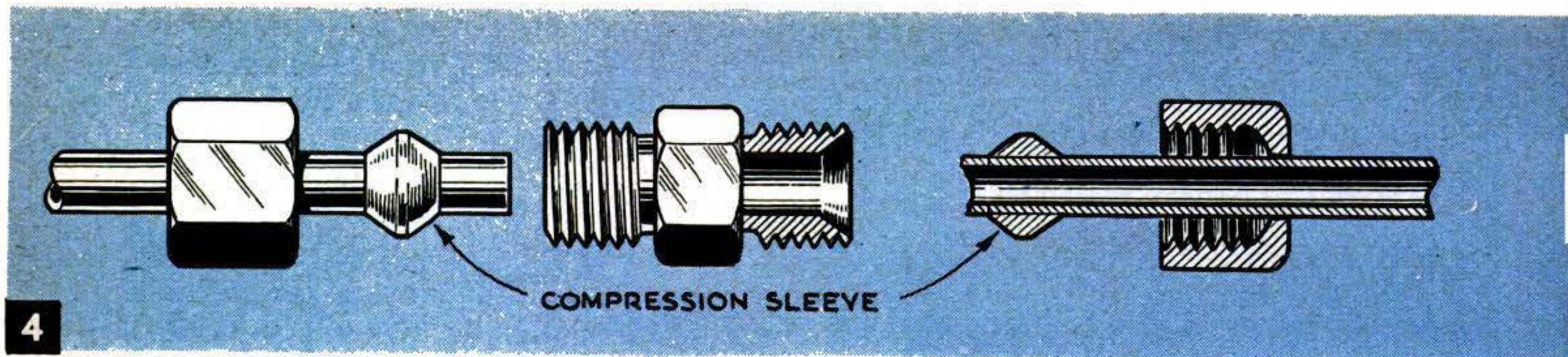
Among the fillers for bending are resin, tar, very fine shot, salt, lead, solder, sand, and special alloys with low melting points. Lead and solder require considerable heat to melt them out of the tube after the bend is made. The special alloys can be flushed out with steam or hot water.

Bending may harden the tubing enough to make it brittle. If further bending is necessary, anneal it first by heating it red hot and letting it cool in air or water.

When you get into work with larger tubing, a simple help for bending is a wooden block with a hole in it slightly larger than the tube diameter. The big photo on the facing page shows such a block in use. Clamp the block in a vise and move the tubing through the hole a little at a time, bending it at each step.

There are many ways of joining tubing or of connecting it to iron pipe. Plumbing shops sell tees, elbows, caps, and other fittings, or you can solder the joints. On smaller tubing, threaded fittings are usually em-





ployed, while larger, plumbing-size tubing generally has soldered fittings.

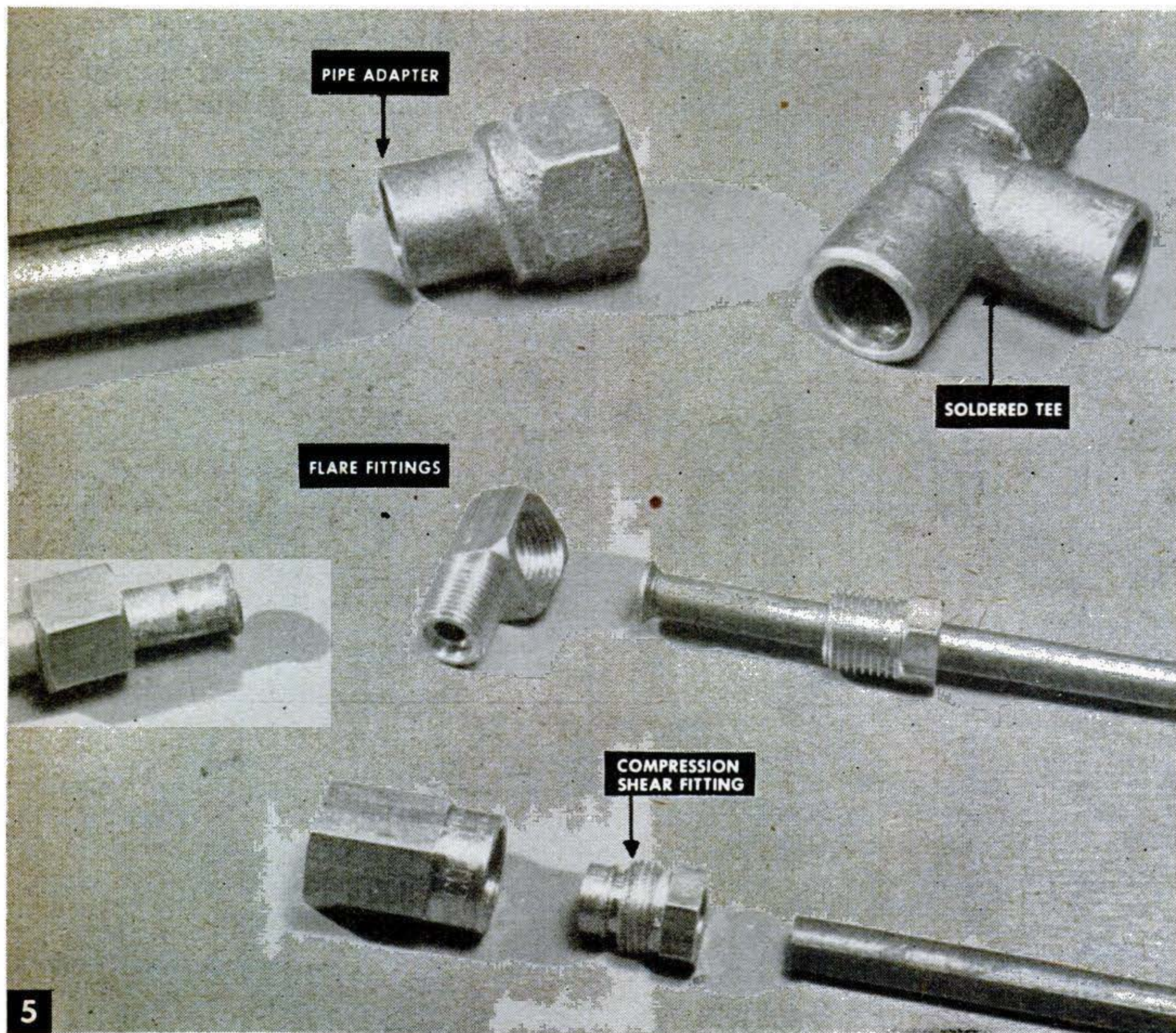
A flared tube end with a compression fitting is one of the most widely used means of joining tubing. A flaring tool, Fig. 3, clamps the tube end in a chamfered hole while a conical tip forces the tube walls outward. Before flaring, however, a nut is slipped over the tube, as shown in the center of Fig. 5. The nut then is tightened to force the flare against the other fitting.

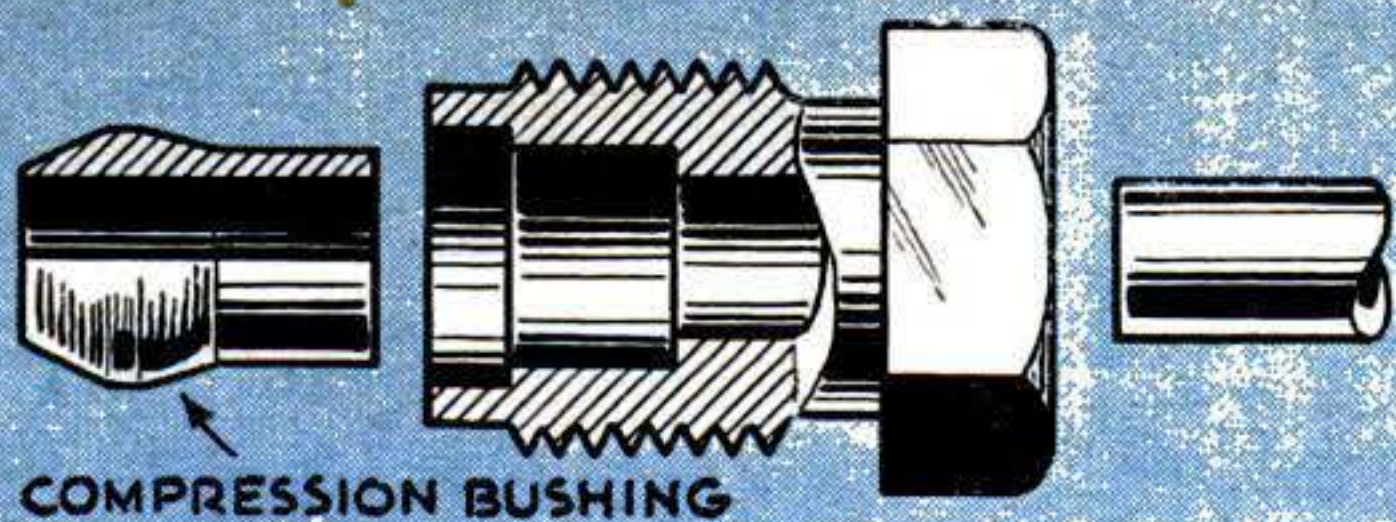
The compression fittings in Fig. 4 squeeze the joining parts tightly against a sleeve or

ring gland slipped on the tubing. The fitting shown at the bottom of Fig. 5 has a collar that shears off to form a sealing ring when the nut is tightened.

Two soldered fittings are shown at the top of Fig. 5, while Fig. 6 shows a female pipe adapter being soldered to a tube. In Fig. 7, a male adapter soldered on the tube is being fitted.

One of the simplest methods of joining two tubes is to slip one over the other, sweat them together, and then wipe solder over the joint. This is illustrated in Figs. 8 and



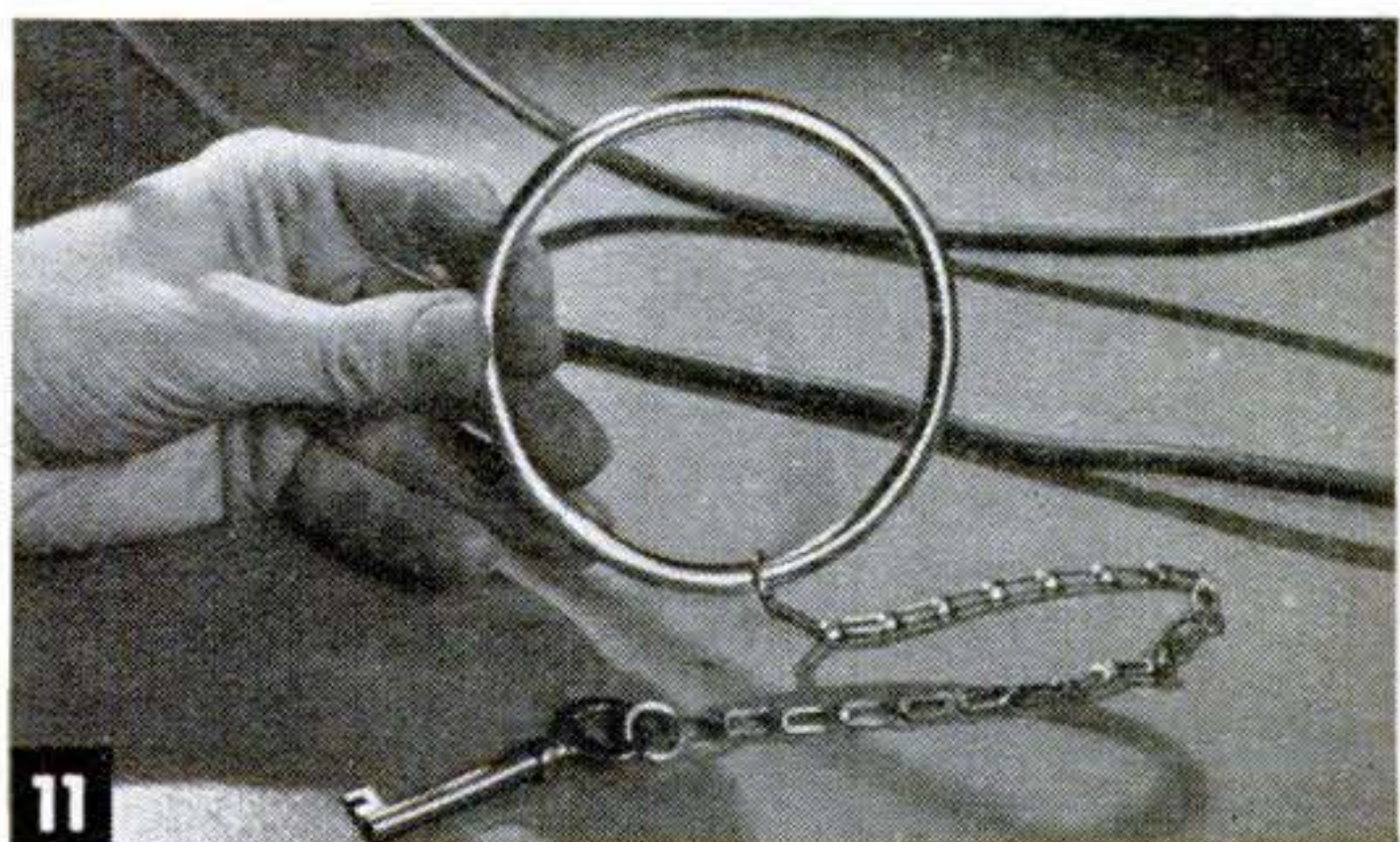
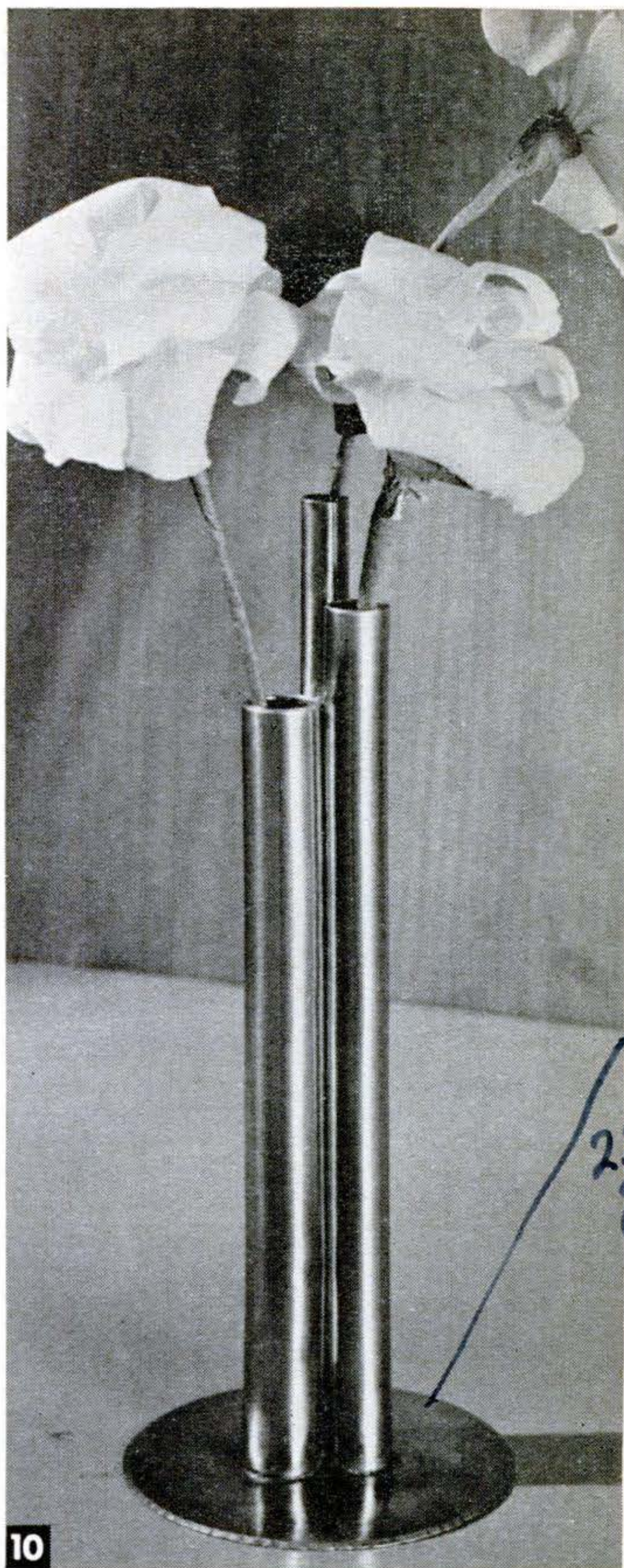
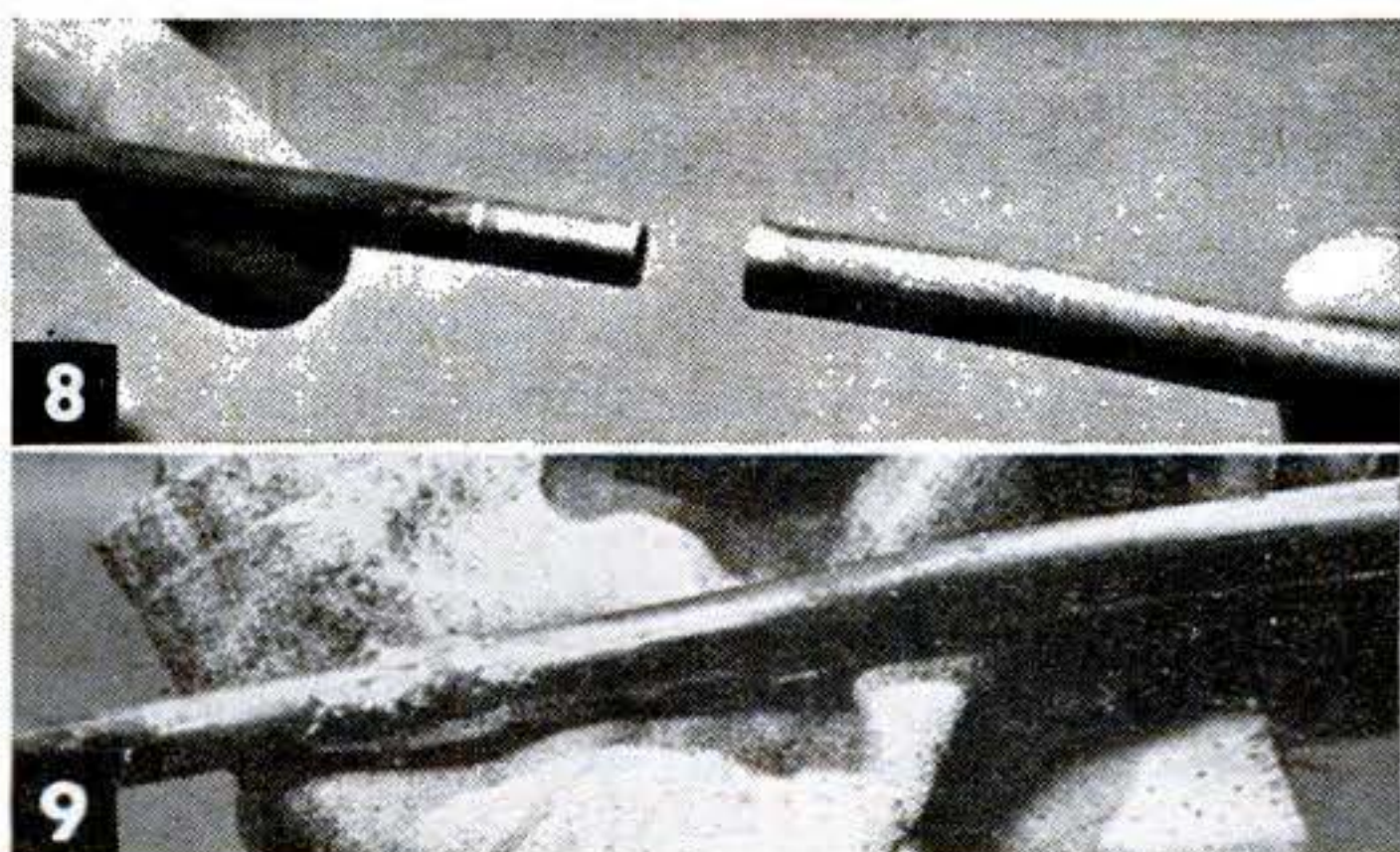
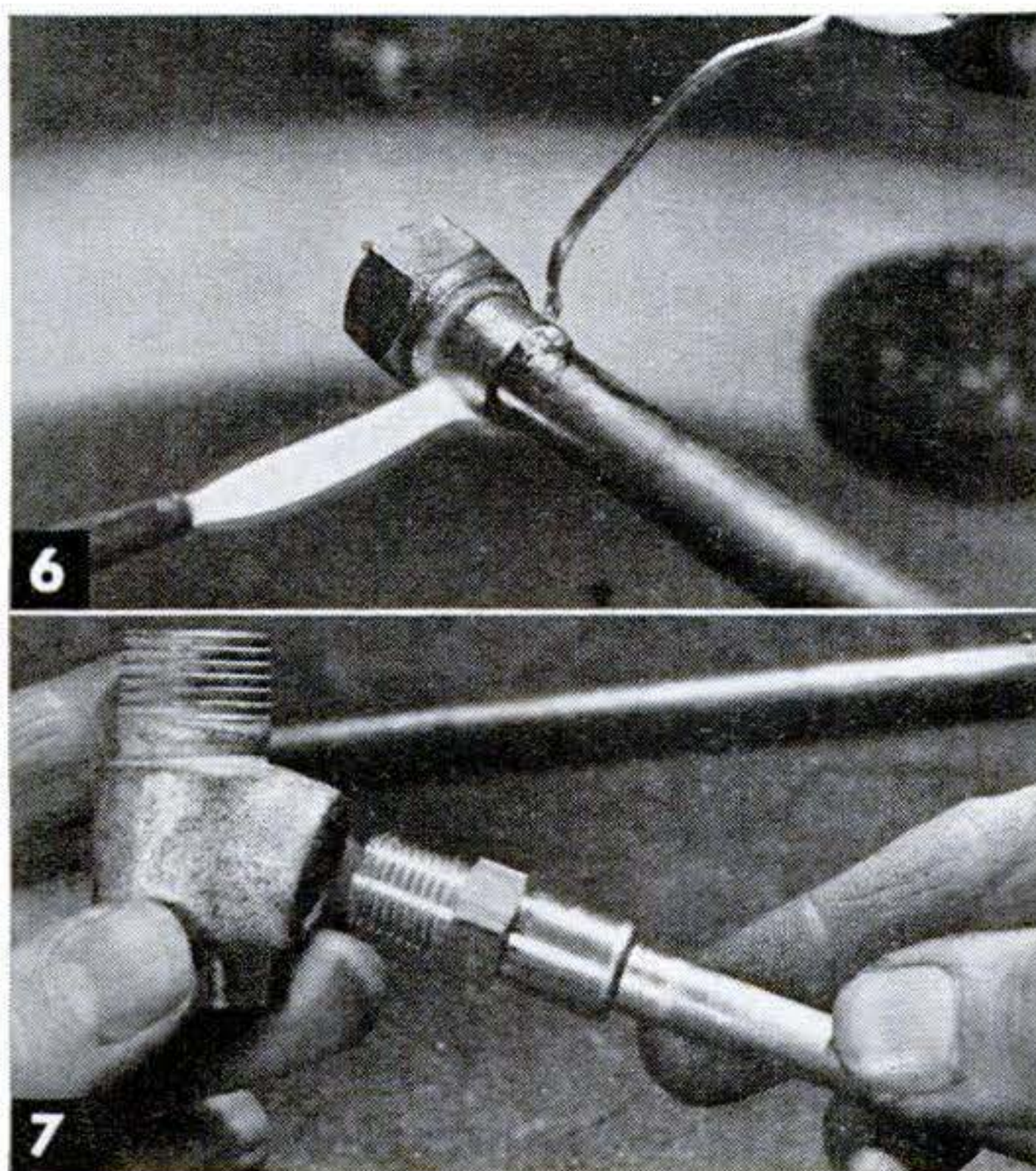


9. If the tubes are the same size, flare the end of one enough to fit over the other.

Copper tubing has unlimited possibilities in decorative craftwork. Shown in Fig. 10 is a bud vase made of three sizes of tubing soldered together and sweated to a base. The tubes were polished on a wire wheel and coated with clear lacquer. The key ring, Fig. 11, is made of $\frac{1}{4}$ " o.d. tubing bent and joined with a copper brazing alloy.

It is wise to coat the finished project with clear lacquer after buffing, to avoid tarnishing.

END



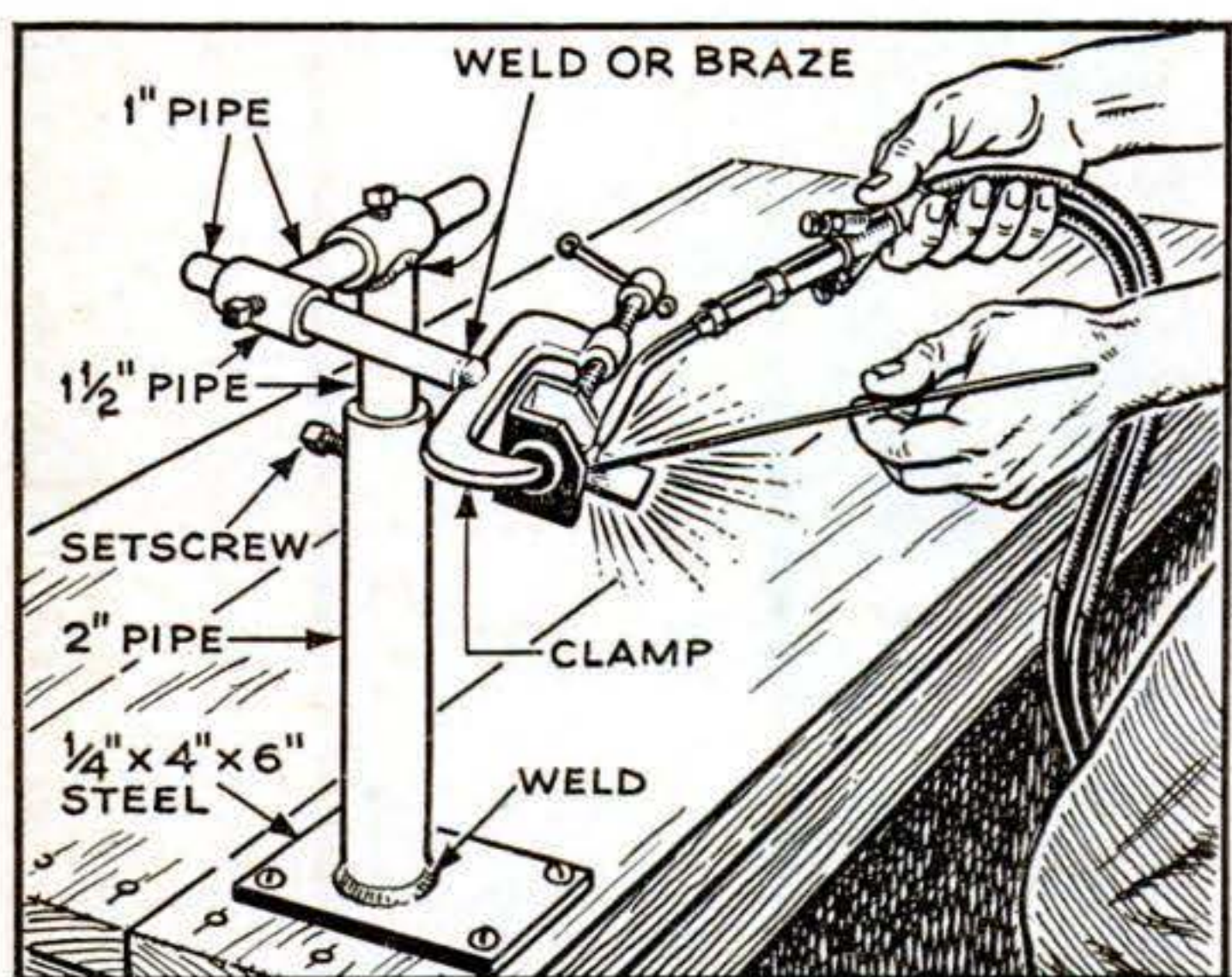
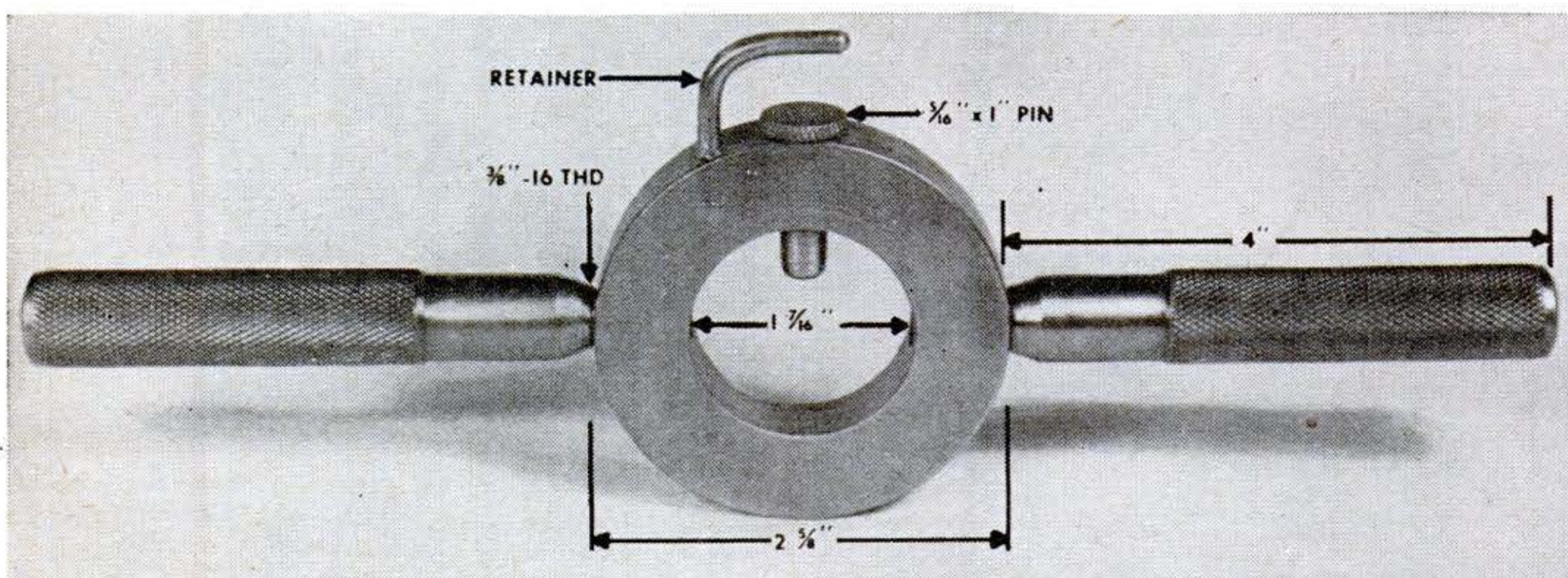
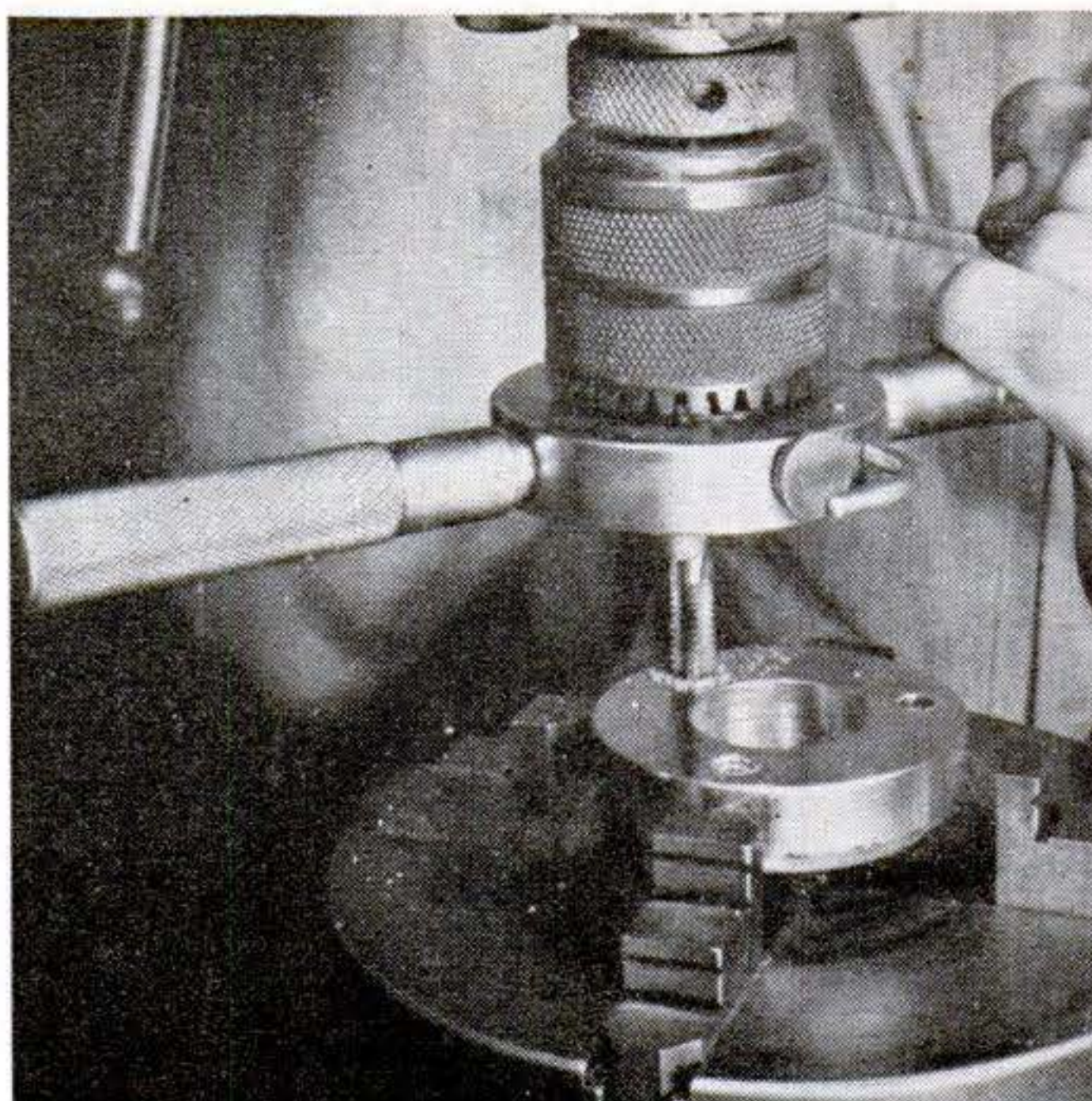


NEW SHOP IDEAS

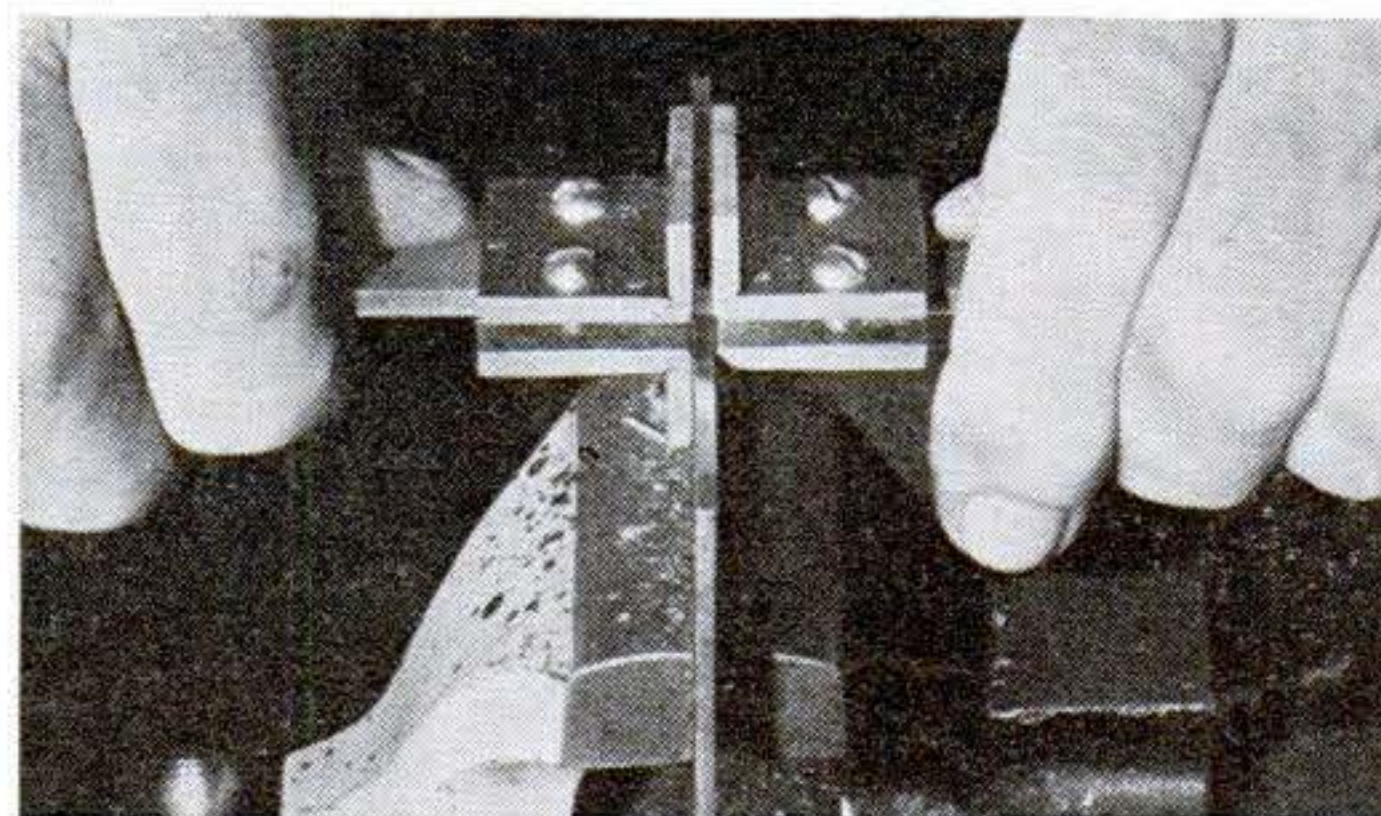
6233

Grip Turns Taps. Your drill press will tap holes with the same precision it drills them. But lacking a special chuck, you can't use motor power, and turning the chuck by hand isn't easy. This gadget, made of cold-rolled steel, furnishes the grip you need.

Made for a Jacobs® chuck, the tool is a steel ring tapped to receive two threaded handles and fitted with a sliding pin that enters any of the chuck-wrench holes. The pin is retained by a bent rod driven into the ring. In use, the tap is first tightened in the chuck. Then the handle is slipped on.—*John A. Bates, Wise, Va.*



All-Angle Welding Clamp. Needing a fixture that would hold work in any position for welding, I made this one from odds and ends of pipe. Smaller pipe would adapt it for more delicate work. Use sections that telescope easily into each other. The three slip joints give directional and height adjustment.—*Gordon Siniard, Barryton, Mich.*

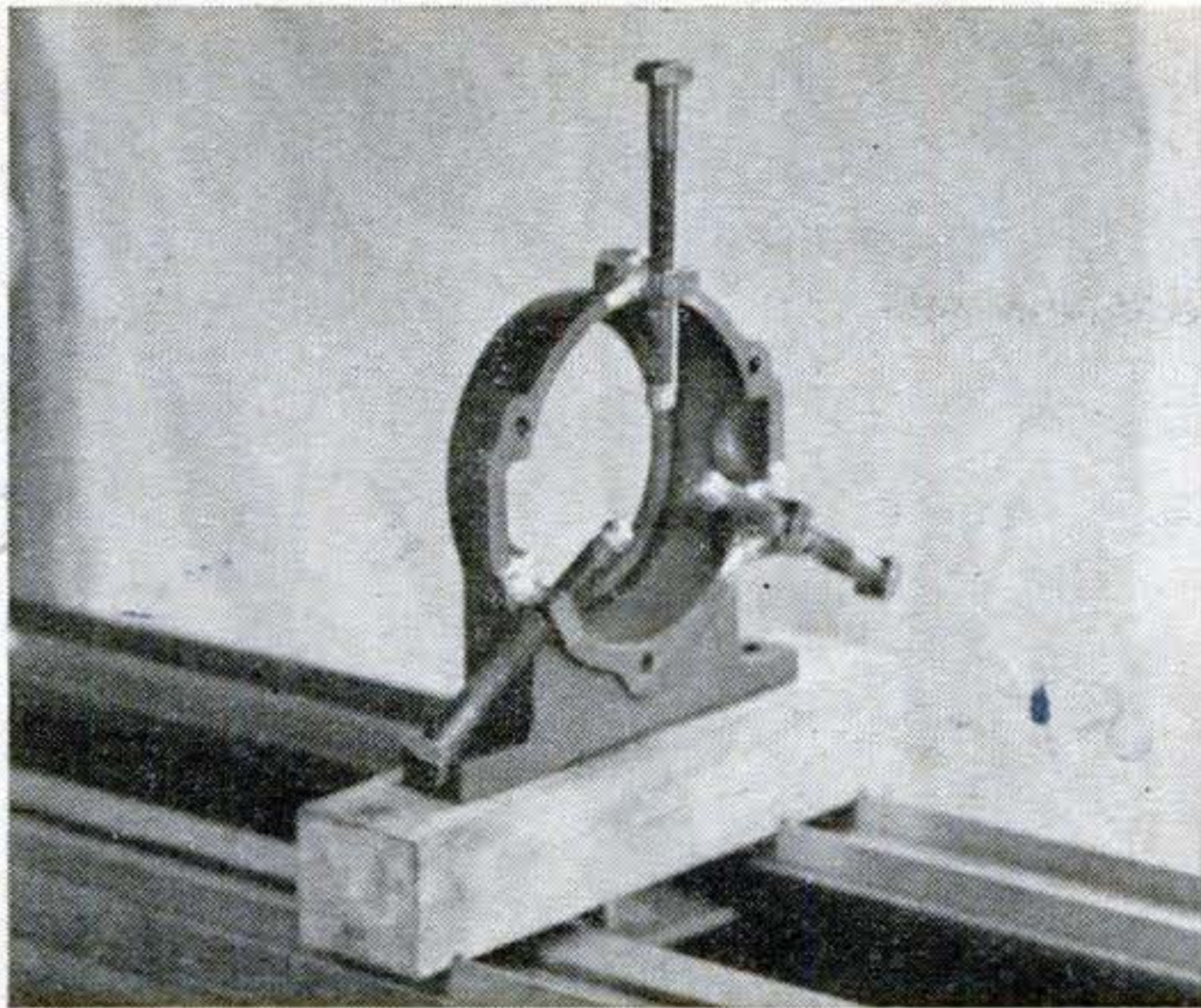


Jig Aids in Drawfiling. It's difficult to finish edges squarely by hand unless you're a whiz with a file. But the jig above makes a true, smooth edge almost inevitable. It consists of four pieces of steel angle, two tapped 8-32 for clamping bolts, and the others drilled clearance size. The length of the sections, and the screw spacing, of course depend on the width of the file. You'll save yourself effort if you oil or grease the work faces that guide the jig.—*Joseph Tracy, Manhattan, N. Y.*

79291

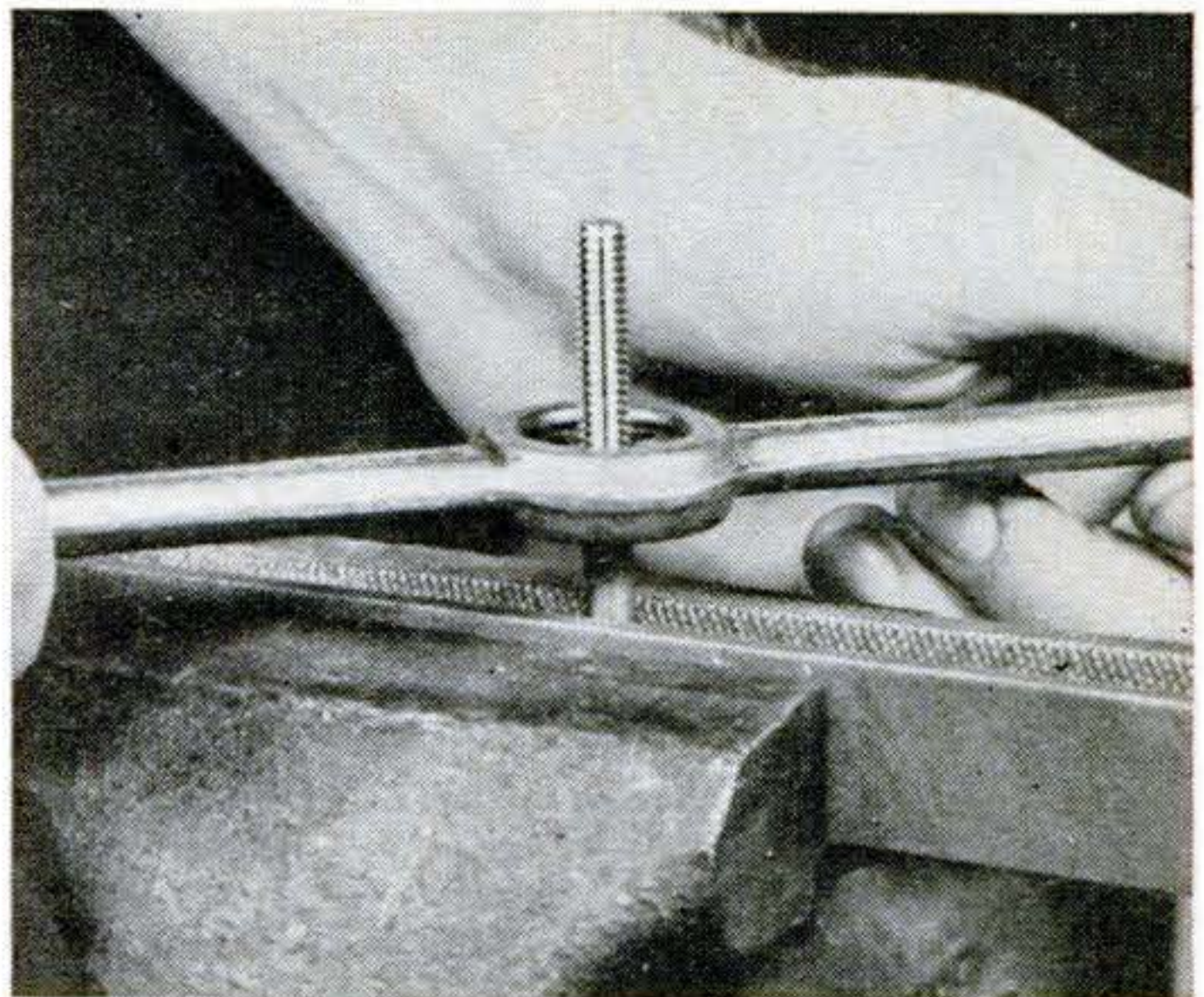
6221

121

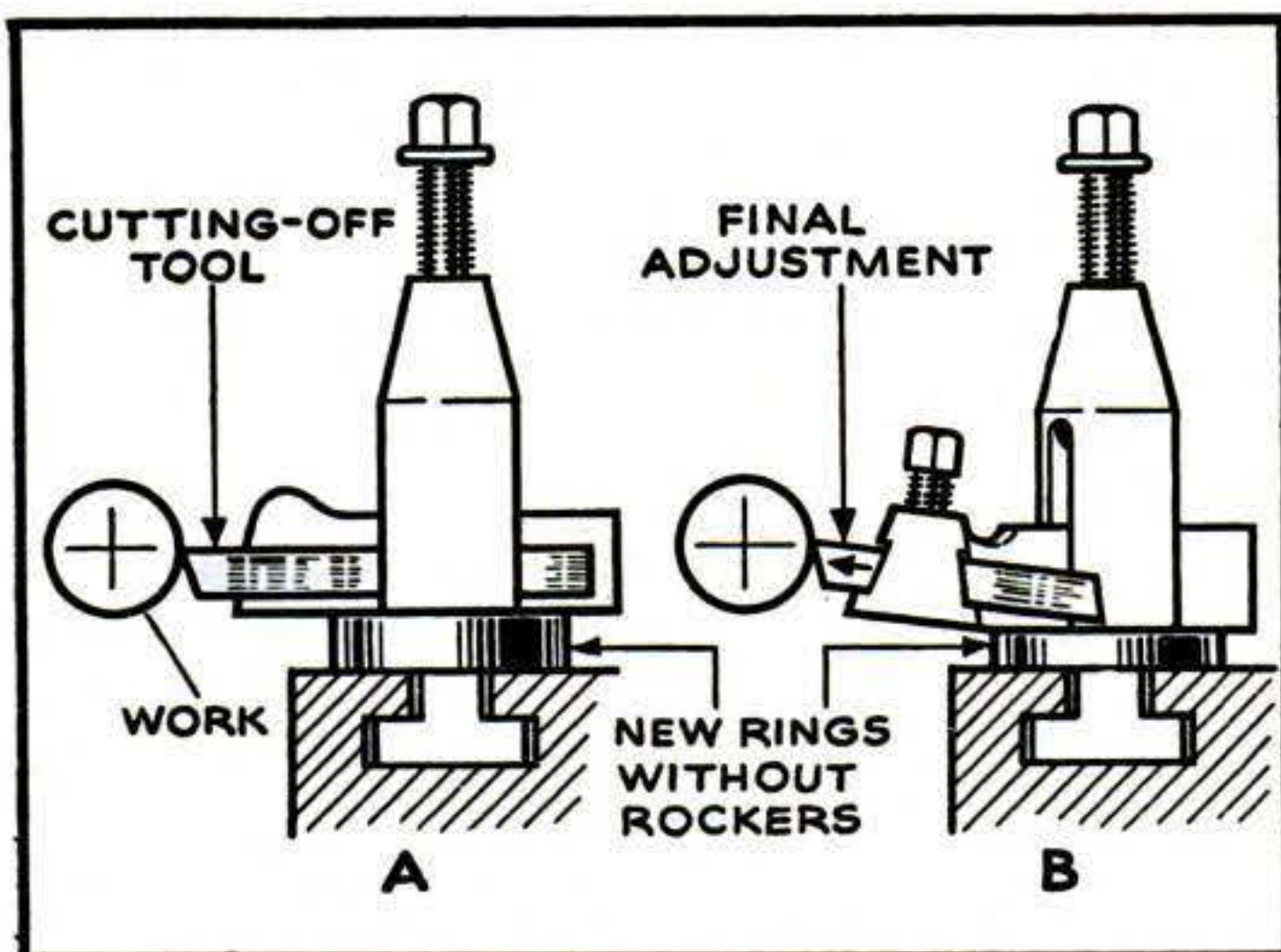


Center Rest Improvised. From a junk-yard casting (part of a Chevrolet truck universal), I made a useful center rest for my lathe. I brazed three nuts 120 deg. apart to the edge of the casting, and drilled and tapped the base for a 5/16"-18 hold-down bolt. A notched hardwood spacer fits the lathe ways. Steel bearing balls 3/8" in diameter are silver-soldered to the ends of the three 7/16"-14 bolts that support the work.—*Edward Munroe, Schuyler Lake, N. Y.*

6200

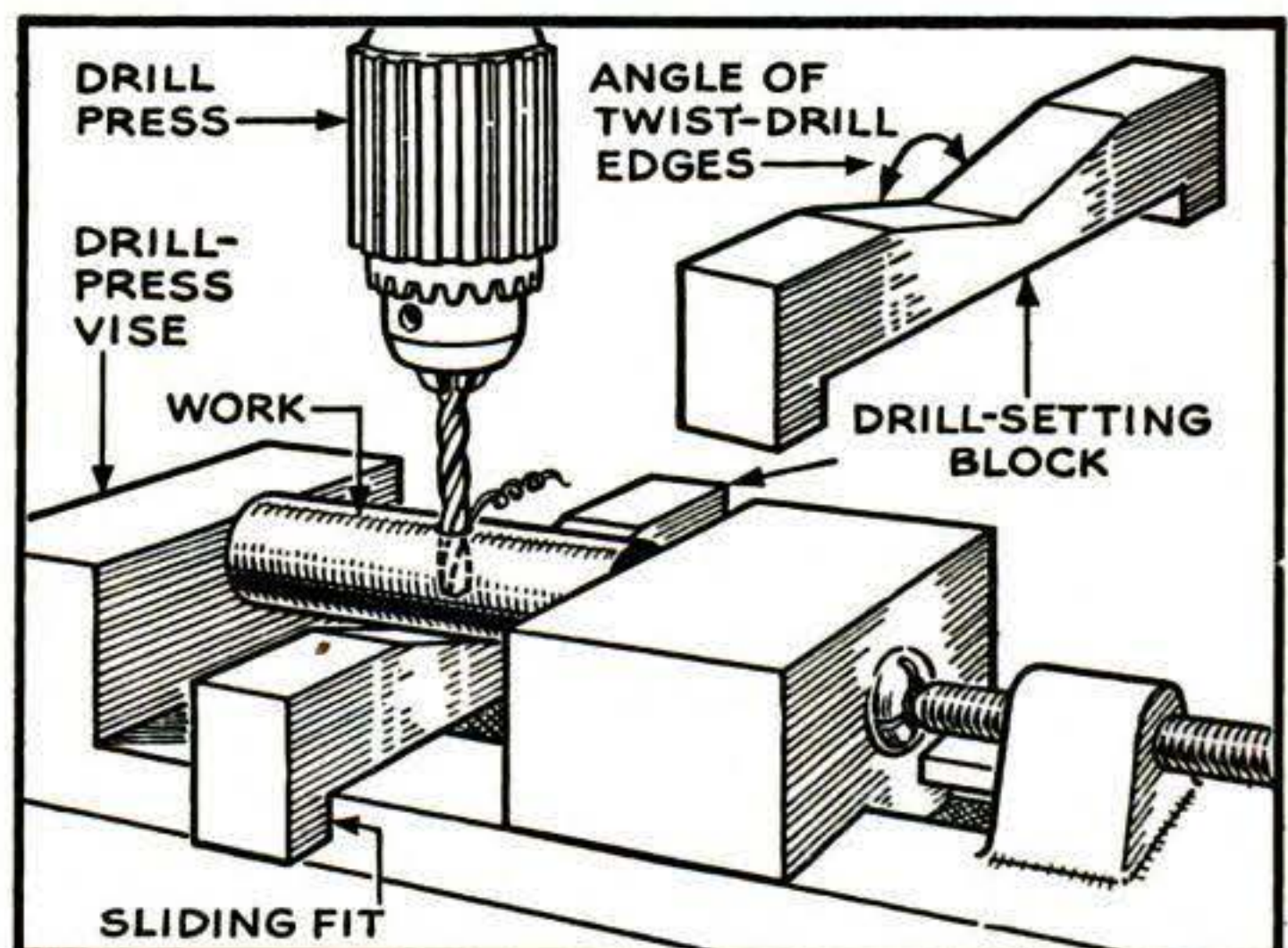


Files Help Vise Hold. If vise jaws are worn smooth and no longer grip tightly, try holding work between a pair of old files or rasps, as pictured above. This setup is especially useful when threading, loosening tight nuts, or performing other operations where round stock must be gripped very securely. It's also handy when there's danger that tubing or pipe might be crushed if the vise is tightened hard.—*Don G. Pittwood, Moscow, Idaho.*



Ring Sets Tool Height. I found it tedious to adjust tool holders and rockers to bring lathe cutters to exact center height, so I made some special rings to do the job for me. Using 2" steel stock, I turned a ring to a thickness that would bring the cut-off tool to the correct level when clamped without a rocker, as at A above. Other rings of different thicknesses can be made to suit other tool holders, as shown at B. In the case of these rings the exact thickness is less critical, since minor adjustments can be made by sliding the bit in or out of the holder to change the height of the cutting edge.—*Allan S. Reid, Valparaiso, Chile.*

6140



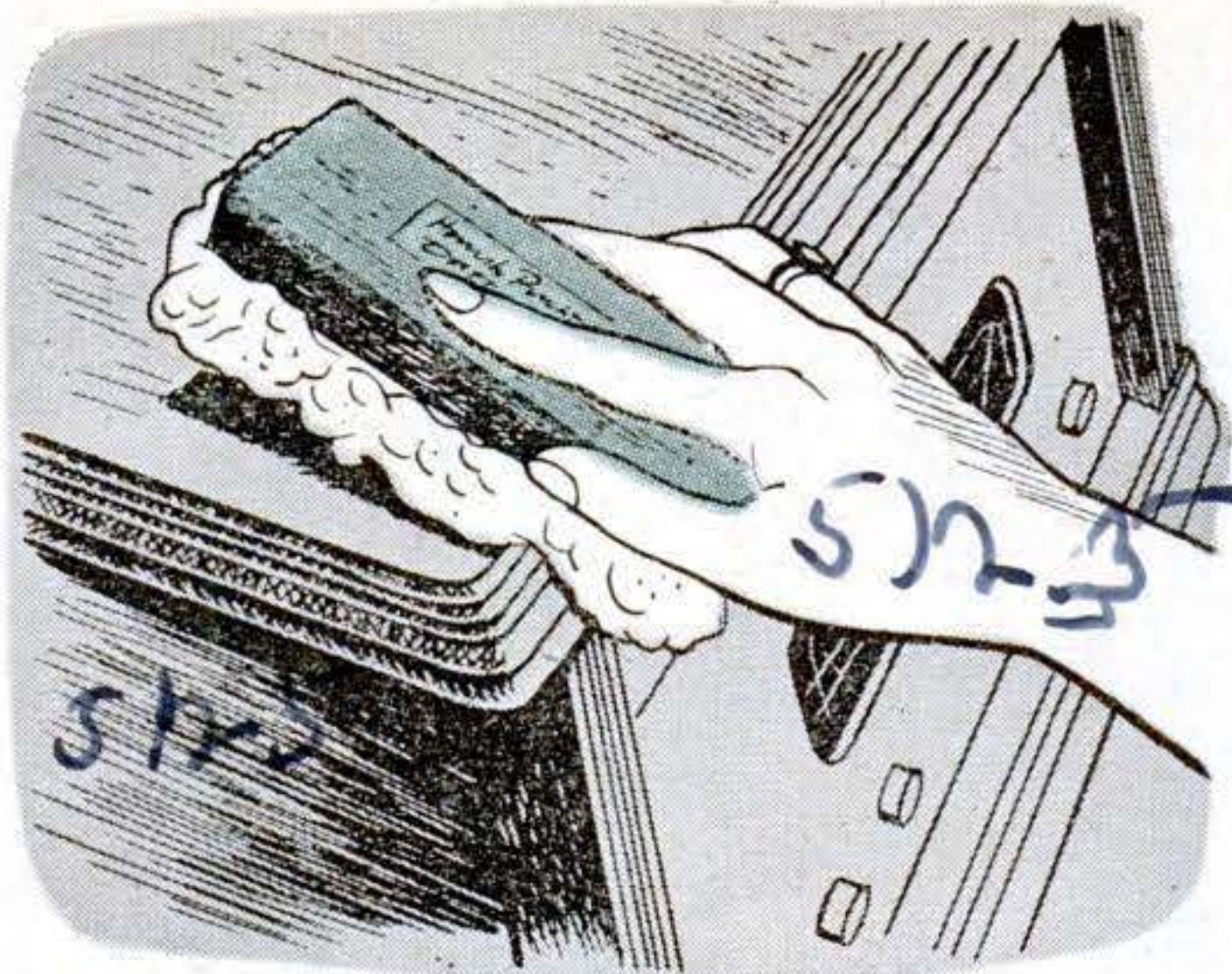
Vise Block Locates Holes. When drilling radial holes in short pieces of round stock, it's difficult to spot the work and drill-press vise accurately. A special V-block made to suit your vise will make the centering job easier. It is a steel block with a central V of the same angle as the twist-drill edges and a pair of lower shoulders that are a sliding fit on the vise sides. To use, place the work between the jaws and locate the vise lengthwise; then remove the work and use the block to locate it transversely; and finally replace the work on the block, clamp the vise down carefully, and start drilling.—*H. Moore, Leeds, England.*

5165

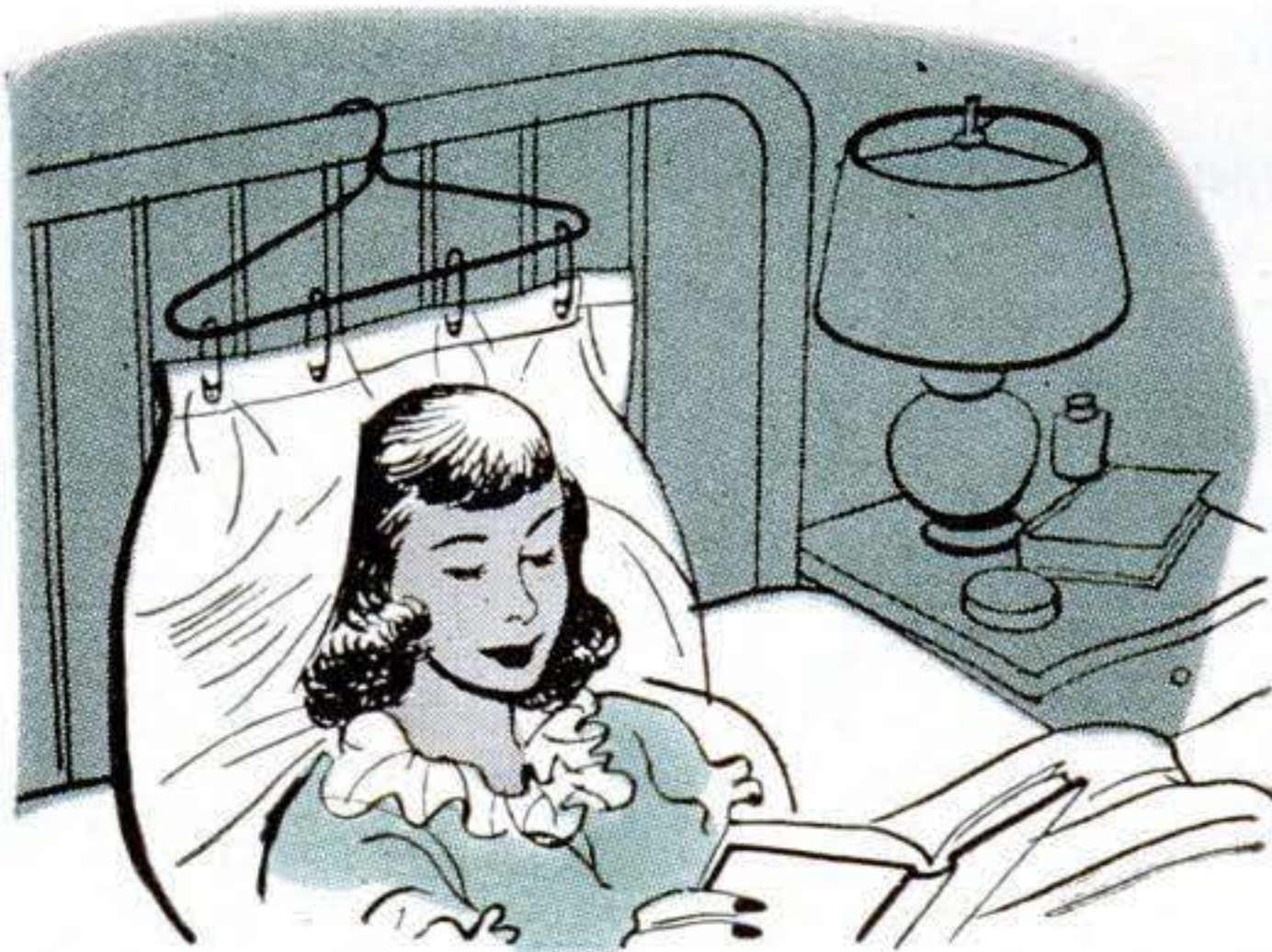
Keeping the Home Shipshape



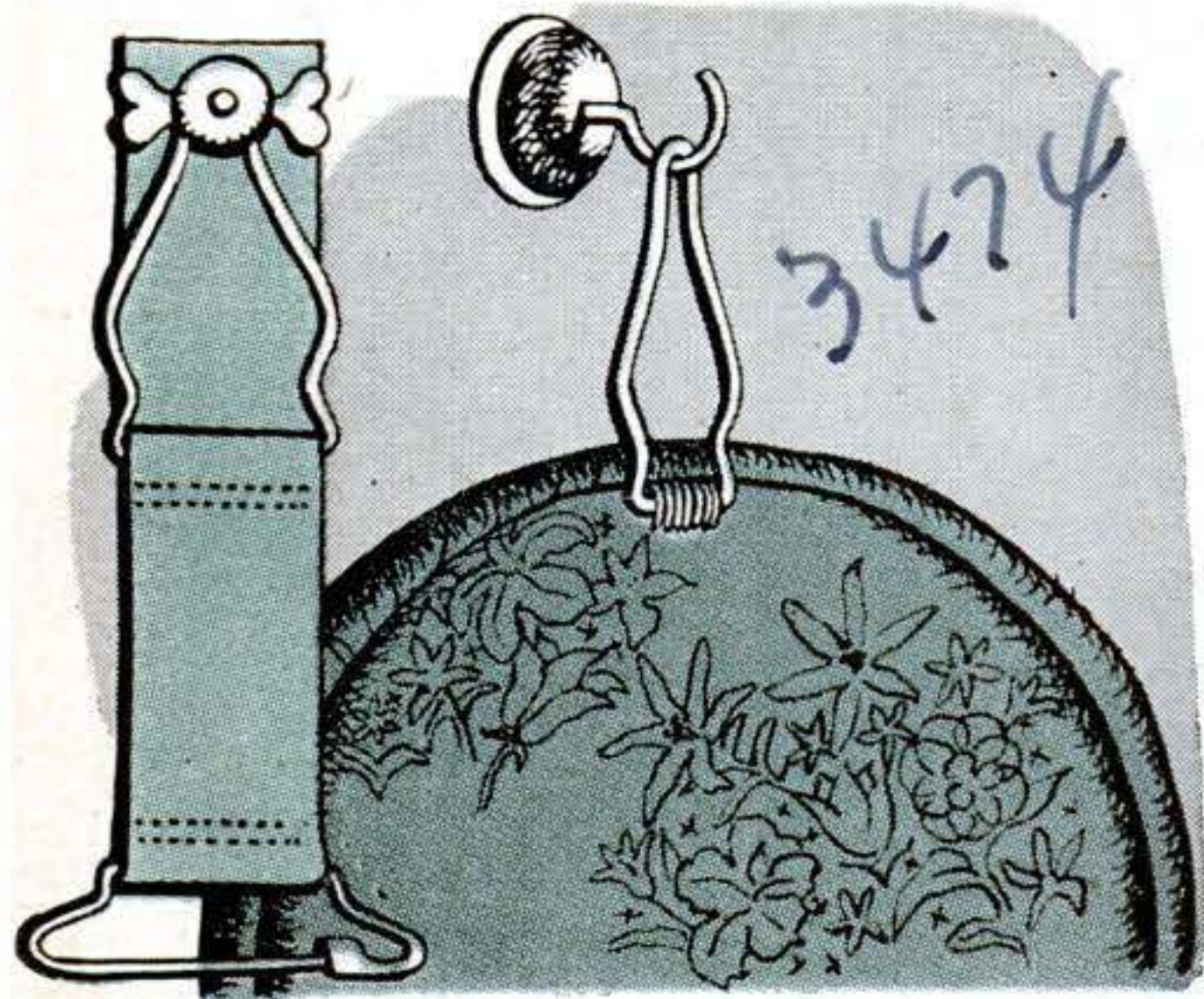
Valances faced with drapery fabrics that can be changed with your curtains will give your color scheme a lift. They are simple to make; molding is held by screws from inside.



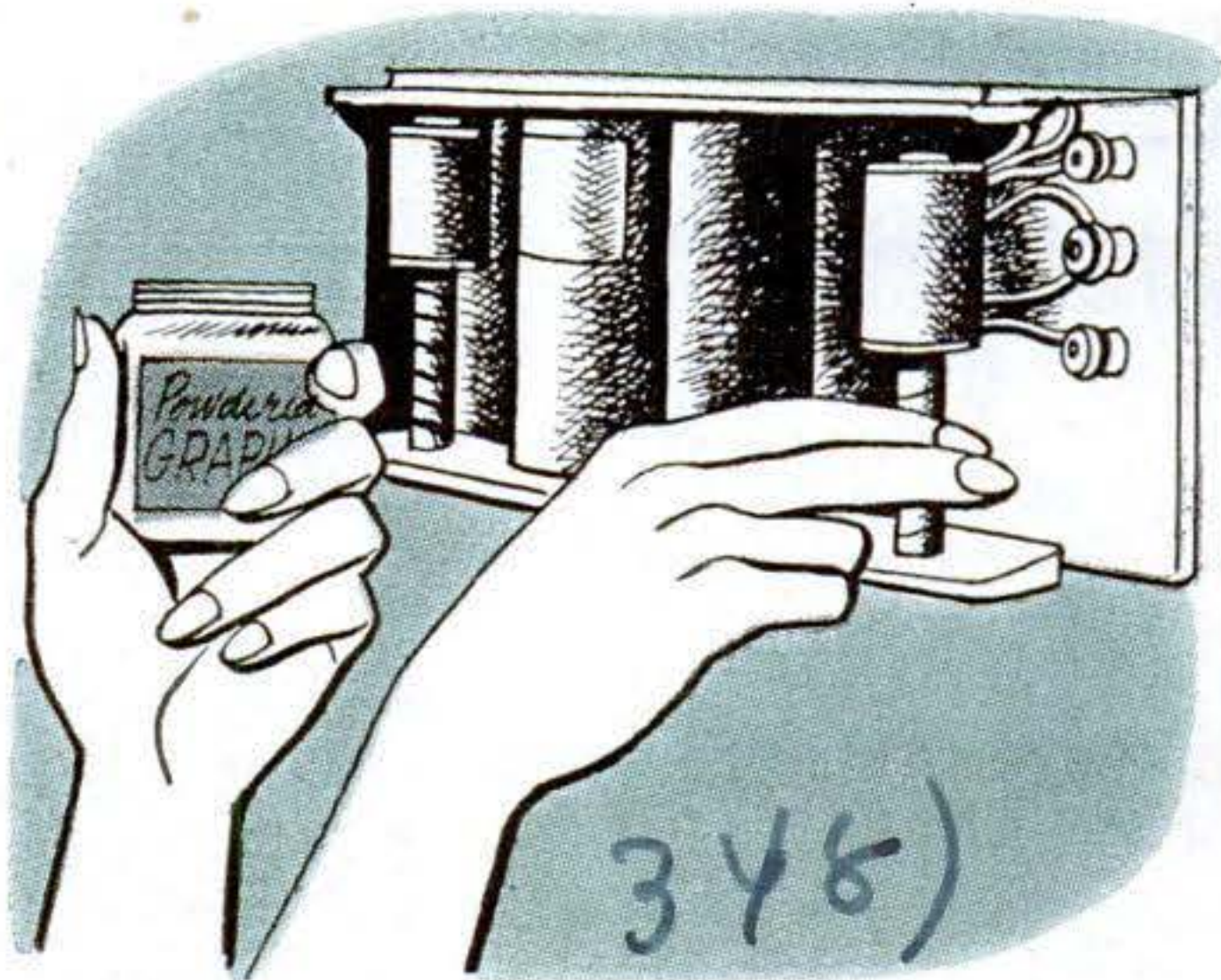
An **ordinary shoe buffer**—a clean one—is fine for polishing furniture, especially pieces with curves and molding. The soft pad adapts itself to such uneven surfaces.



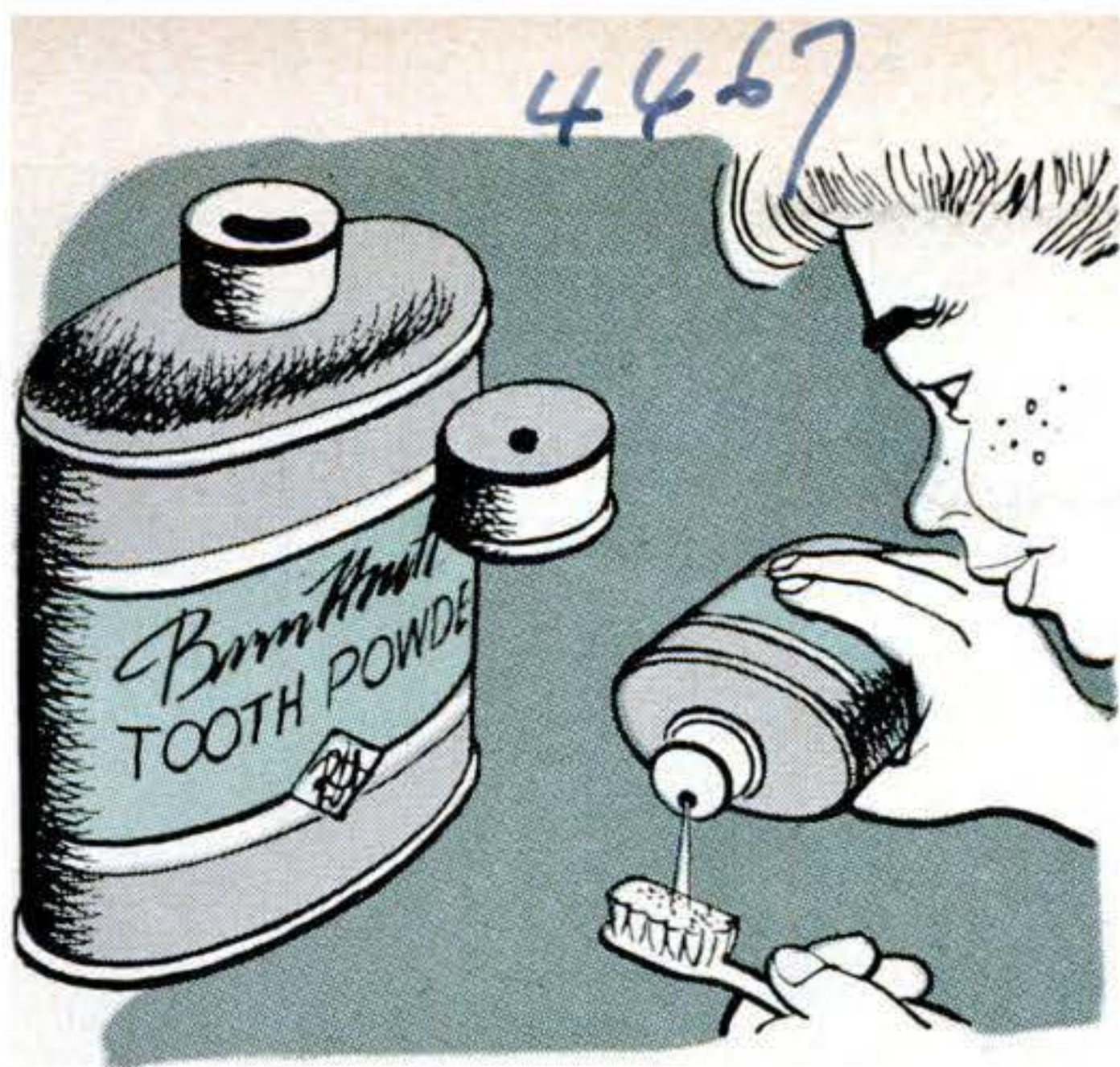
A **sturdy wire coat hanger** and several large safety pins will hold a pillow comfortably upright against the back of a bed. Stick the pins through the pillow case and the pillow.



Hang-up hooks for pot holders can be made from metal clasps taken from old garters. Remove the clasp and sew it to an edge of the holder as shown in the drawing above.



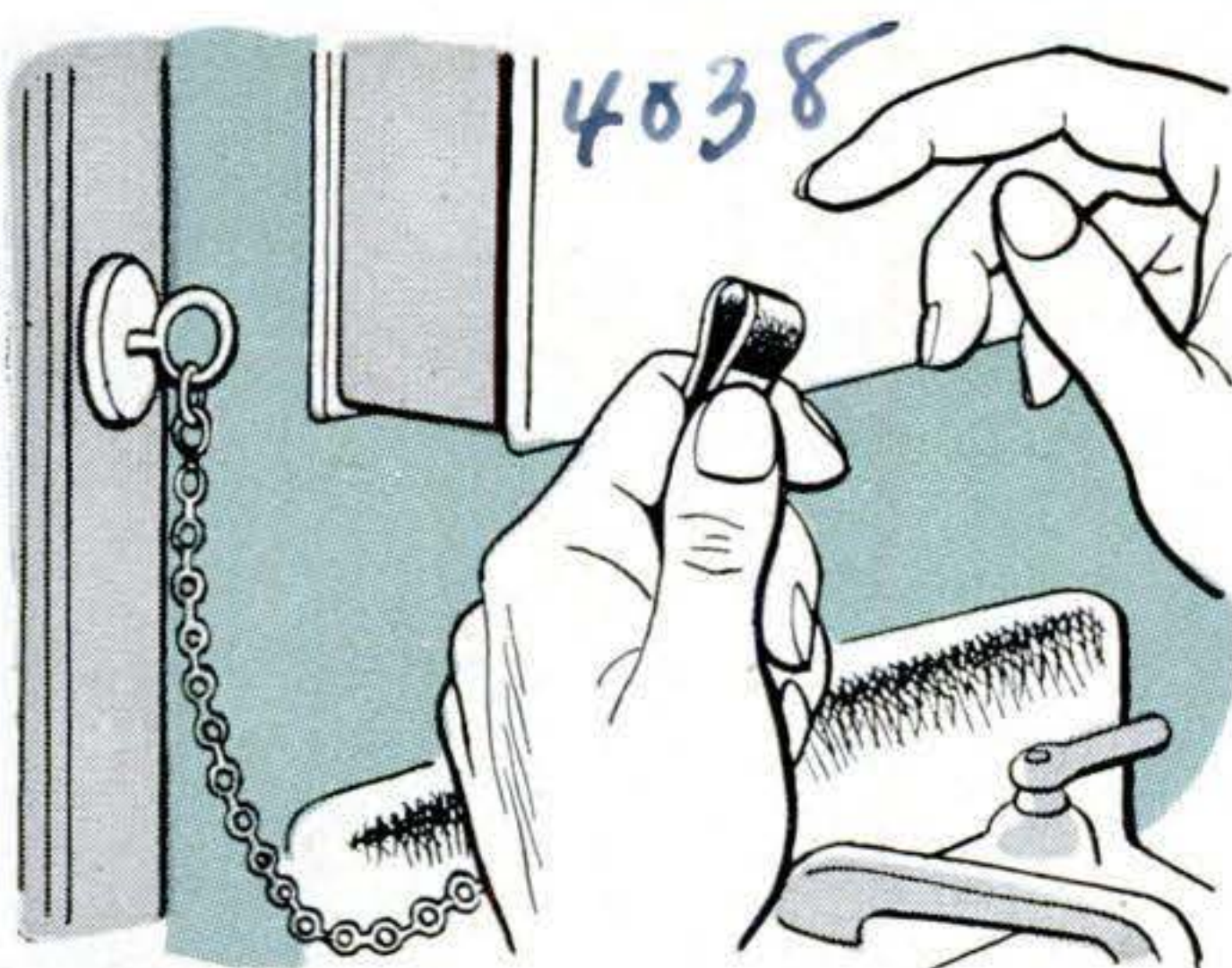
Sluggish door chimes that refuse to respond to careful cleaning will often sound better after a little powdered graphite is blown onto the plunger to smooth its way.



Tooth-powder waste due to excessive flow from large spout openings can be stopped by drilling a $\frac{1}{8}$ " hole in the cap. Leave the cap on and rotate it to open or close the hole.



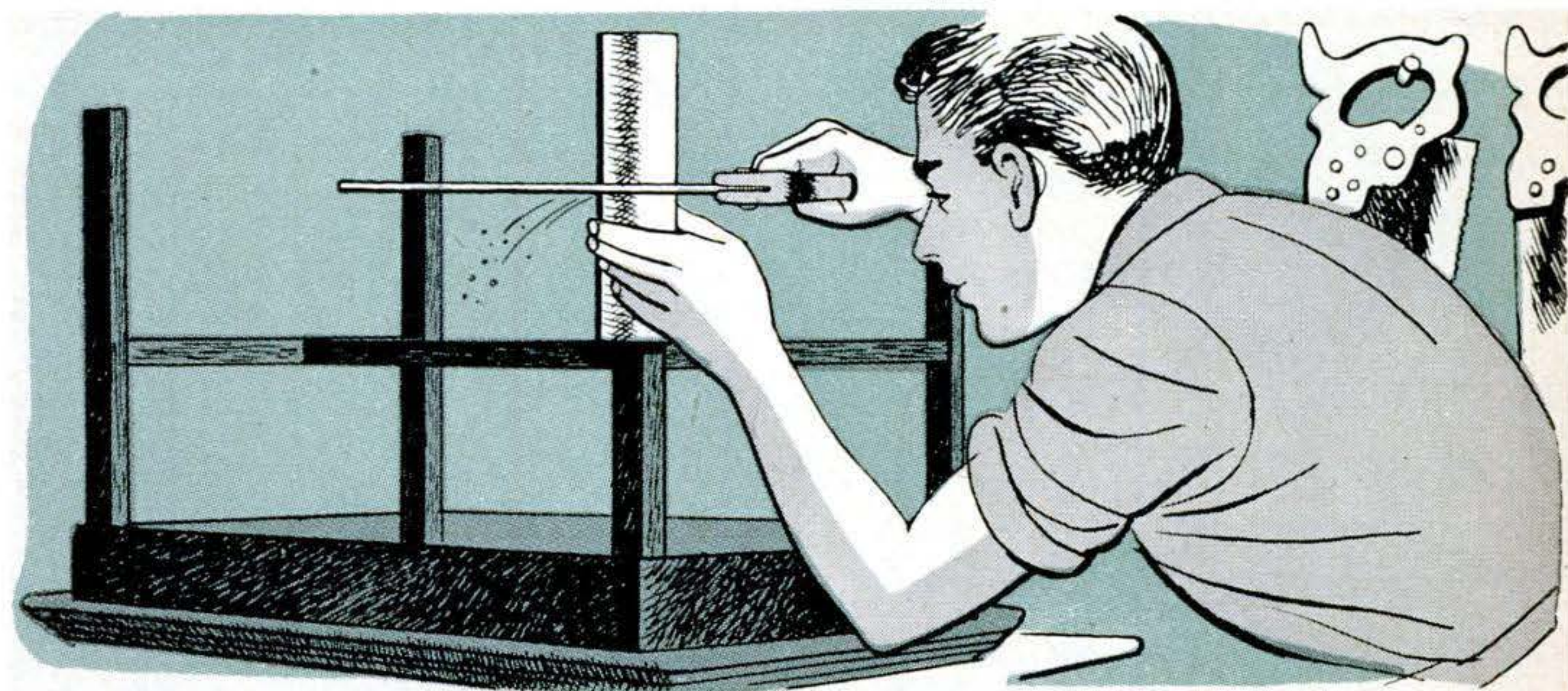
Lower cupboard shelves become more accessible when fitted with an extra bottom to which a rear ledge has been butted. Simply pull out the false shelf to get at the contents.



Absent-minded users won't carry the nail clipper out of the bathrom if you attach it to the wall with a chain. Drill the clip for the chain if it doesn't have a hole already.



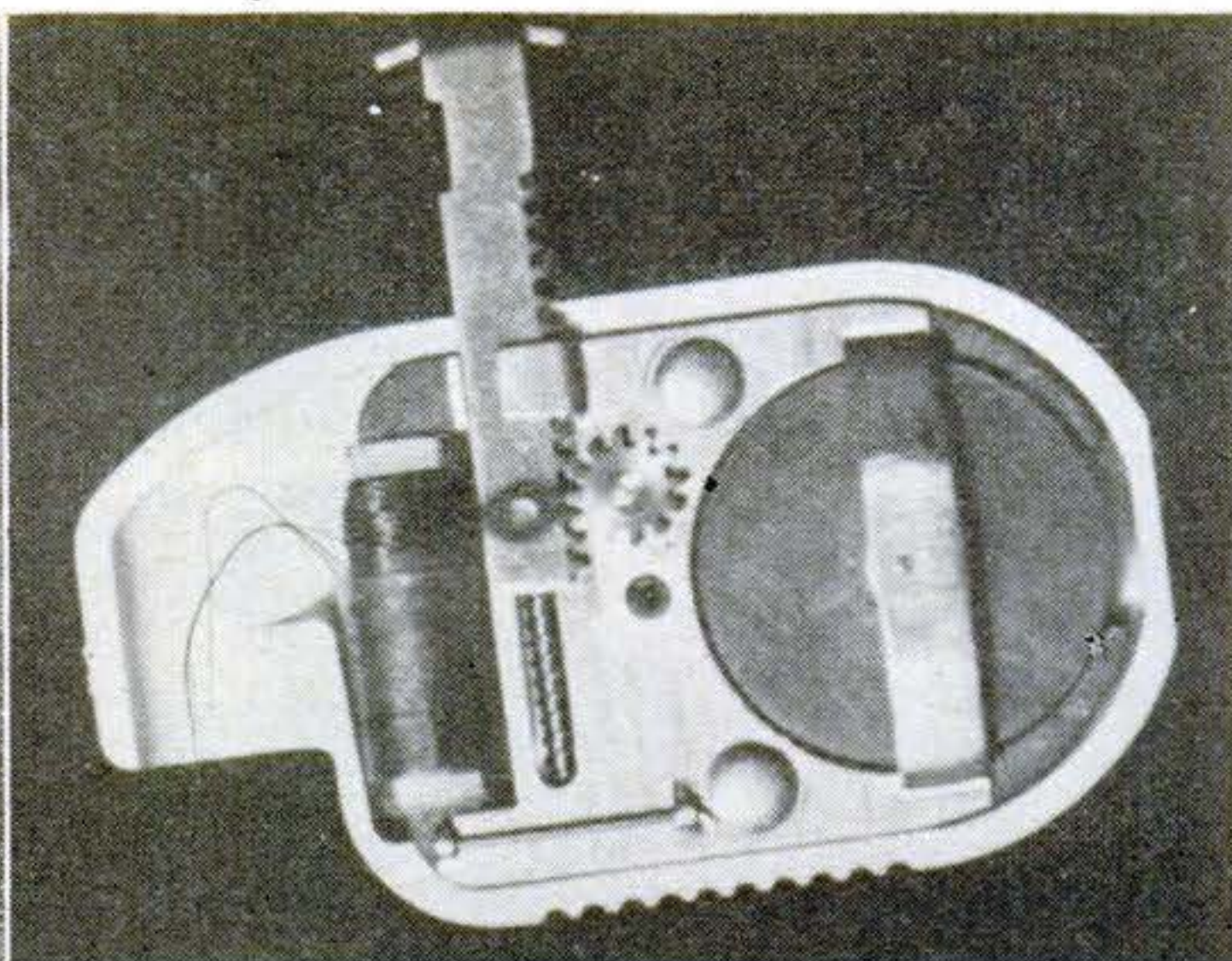
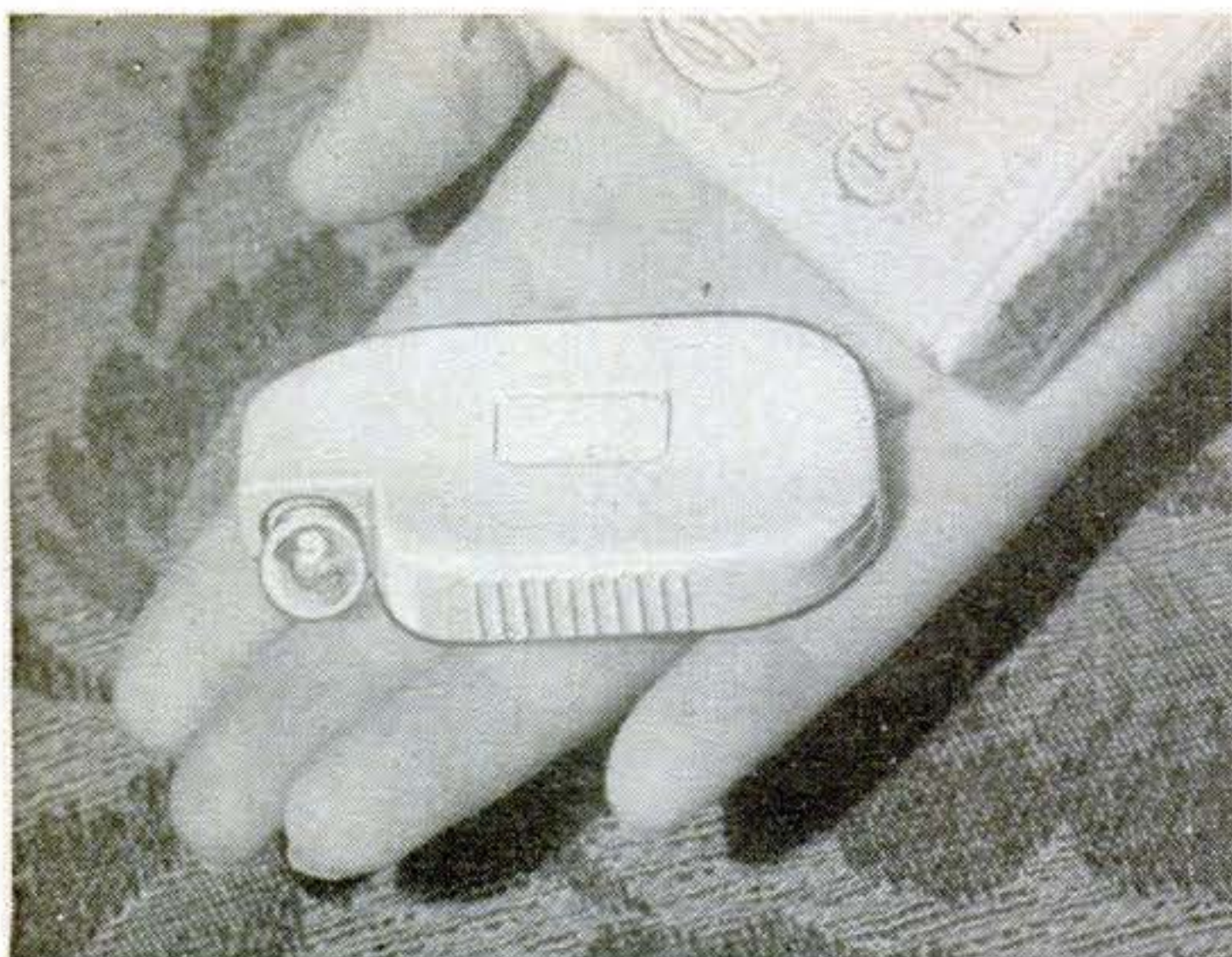
Do your children jam the type bars and generally gum up your typewriter by banging the keys? To prevent damage, drop a wad of paper on the type when you leave the machine.



To even up or shorten the legs of a table or chair uniformly, cut a slot in a cardboard mail-

ing tube, slip it over each leg in turn, and use it to scribe a sharp mark or as a saw guide.

6189



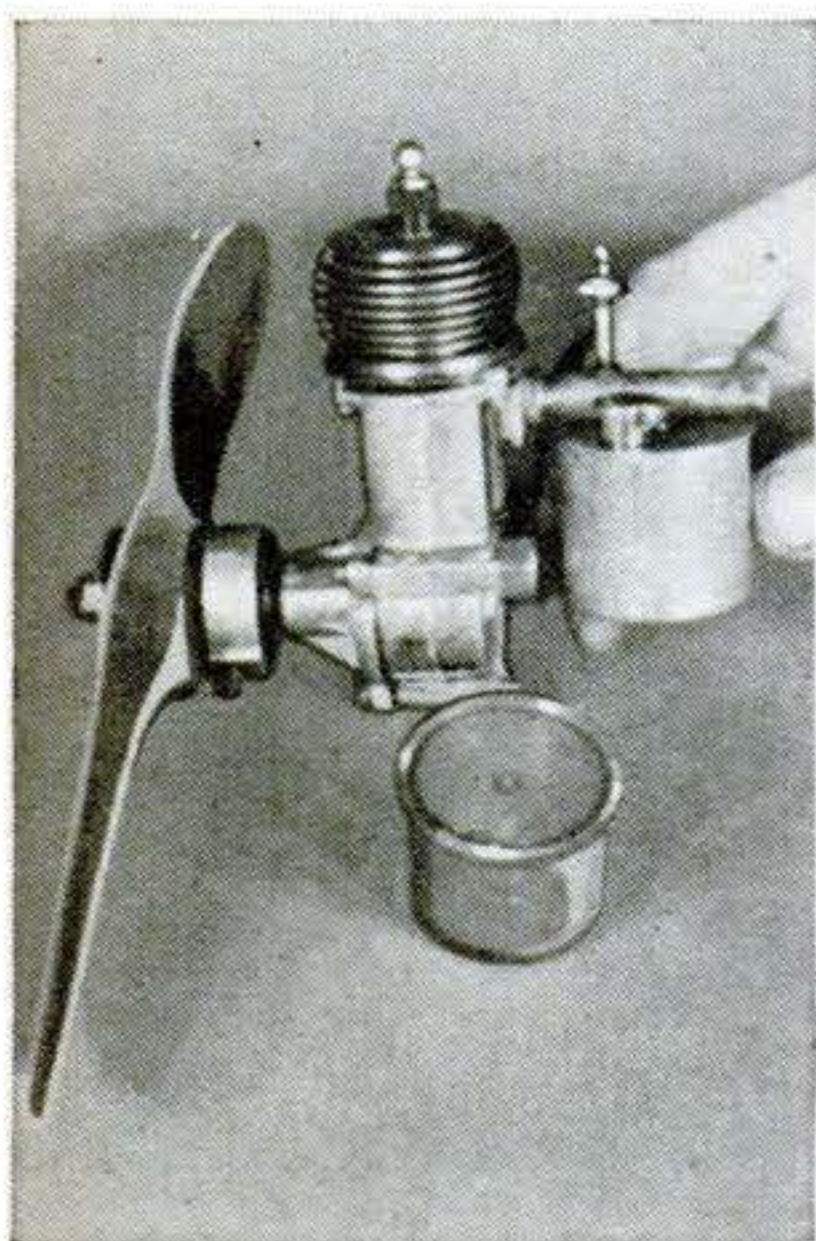
Pocket-Size Flashlight Powered by Tiny Magneto

A VEST-POCKET flashlight that operates without batteries has been put on the market by the Jeny Corporation, Merchantville, N. J. Electricity for the bulb is provided as needed by pumping the spring-returned

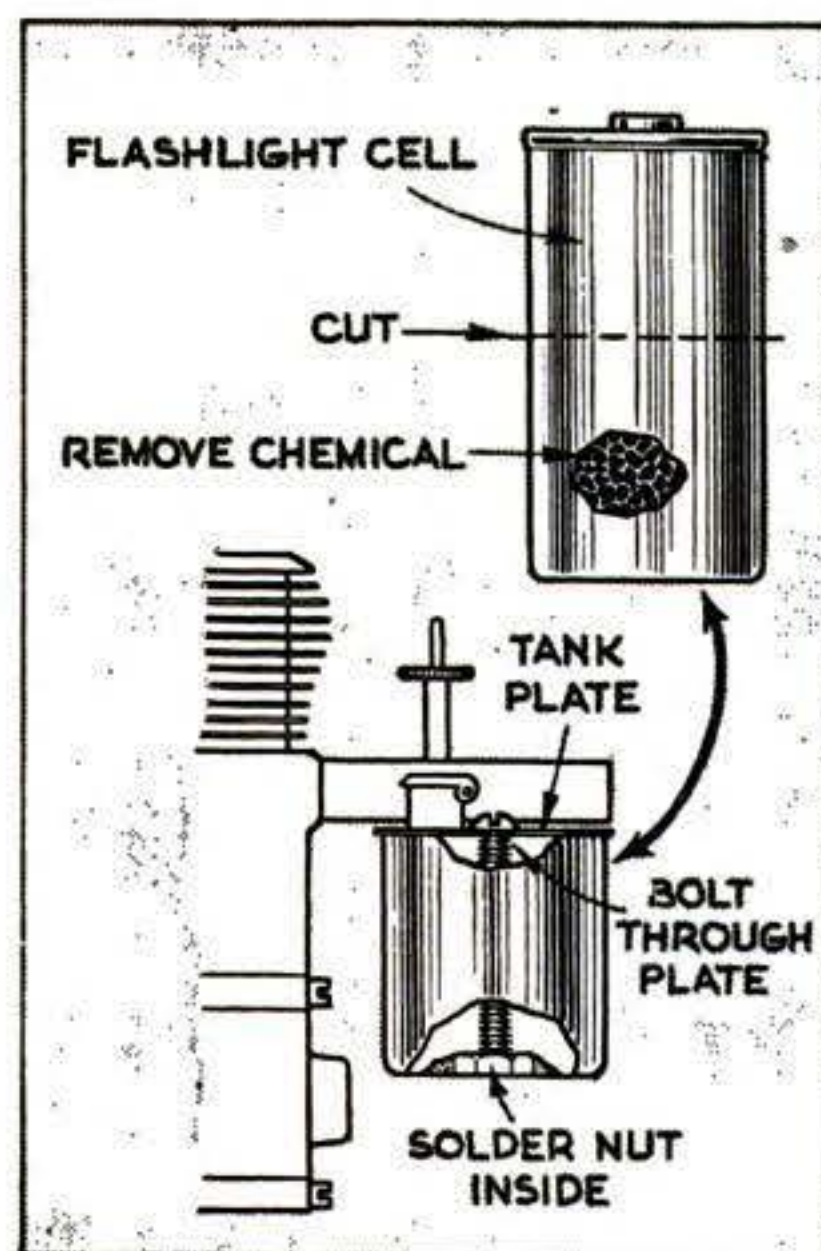
magneto lever. The complete unit weighs about 2½ oz. and its size may be judged from the photo at the upper left. As no lens or focusing device is used, the lamp gives wide-angle illumination.

6201

Tank for Glow-Plug Fuel

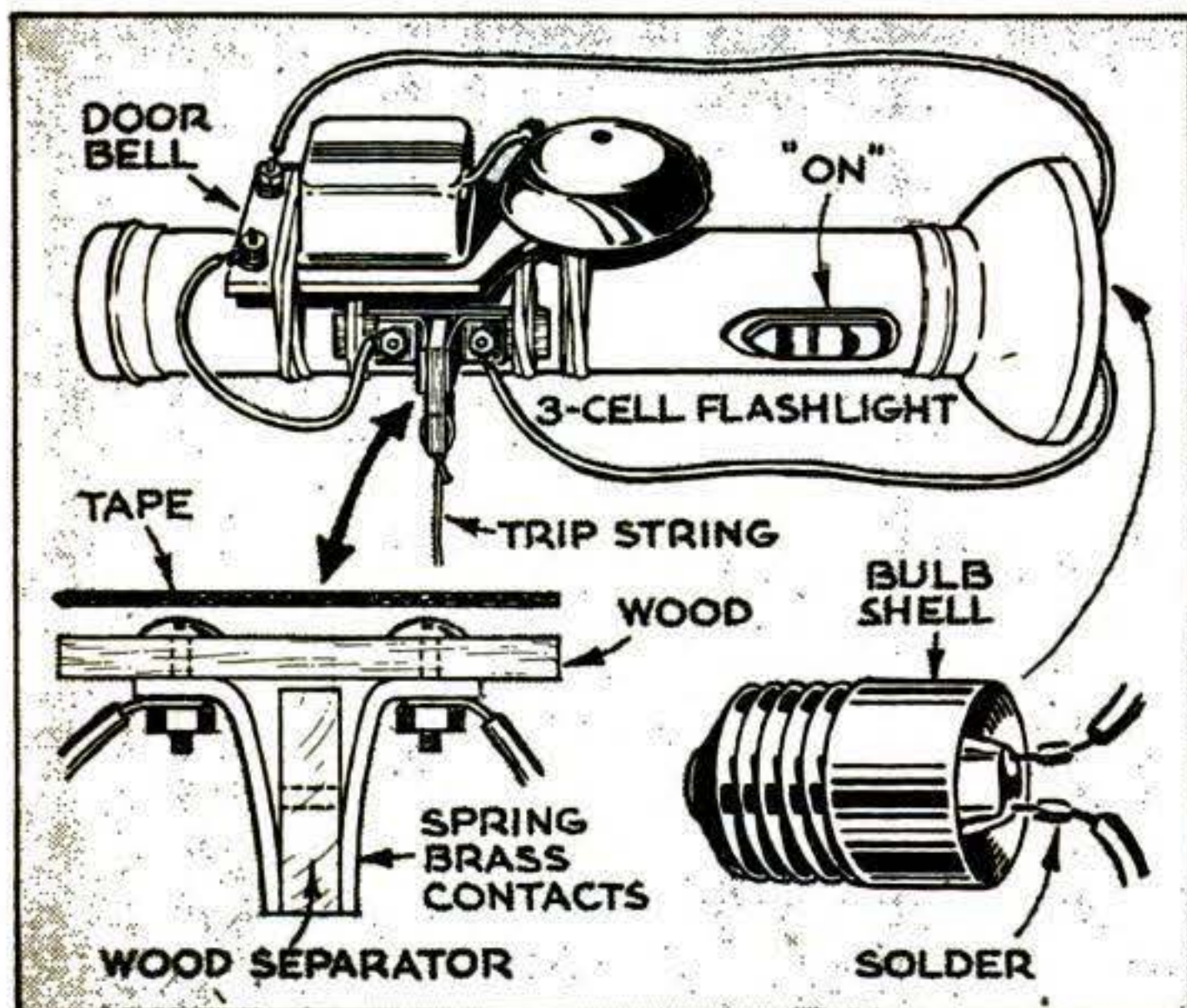


To USE a glow-plug ignition system on a conventional model engine, I had to change the fuel tank as well as the fuel, for glow-plug fuels react with plastics. I removed the original tank and improvised a replacement from a discarded flashlight cell by sawing it in half, removing the chemical, and soldering a nut to the bottom. A bolt cut to the correct length secures the tank to the plate. The smaller "C" cell makes a better fit on some engines.
—Don G. Pittwood, Moscow, Idaho.



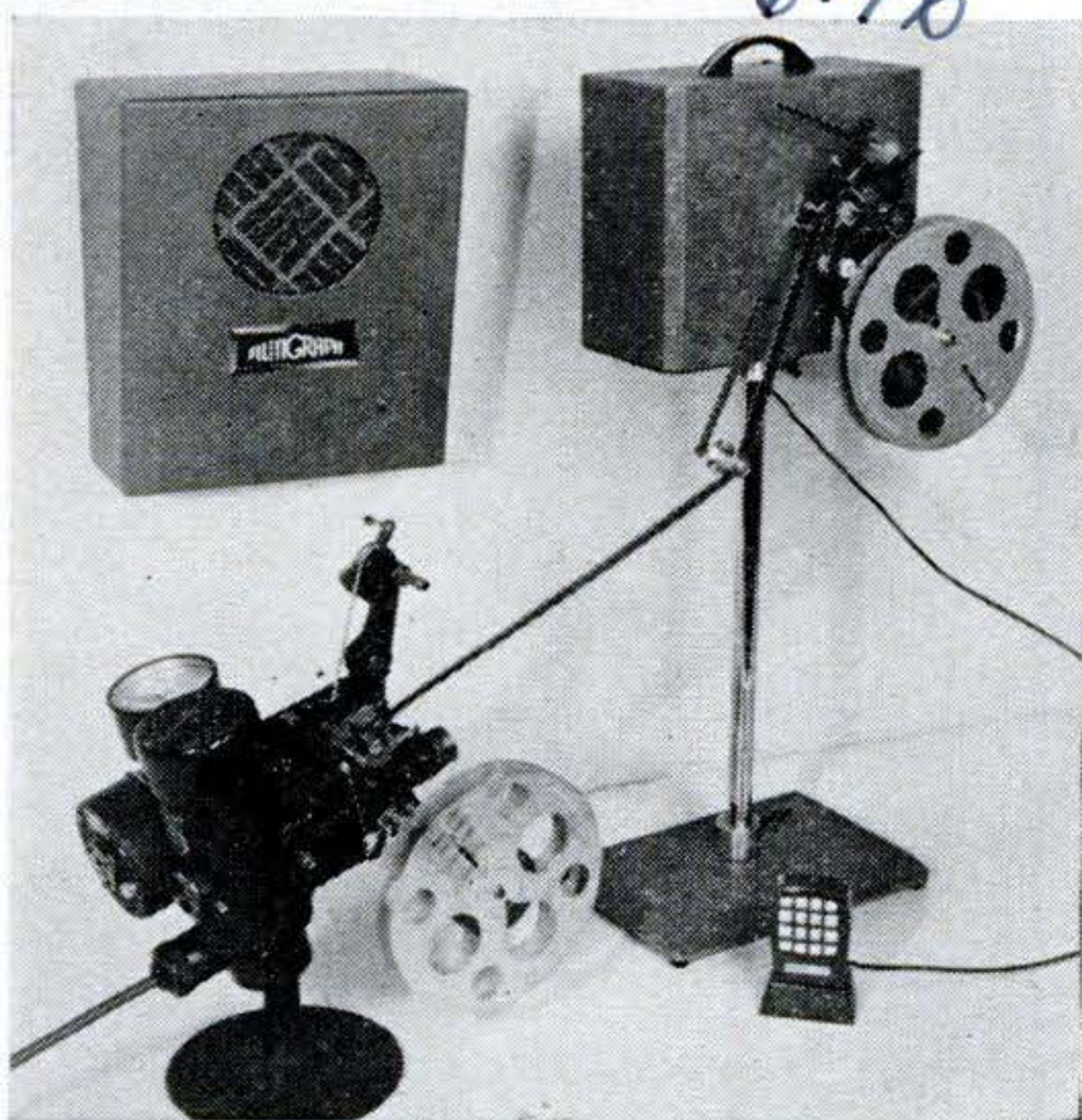
Portable Alarm Can Be Used Where You Need it

4071

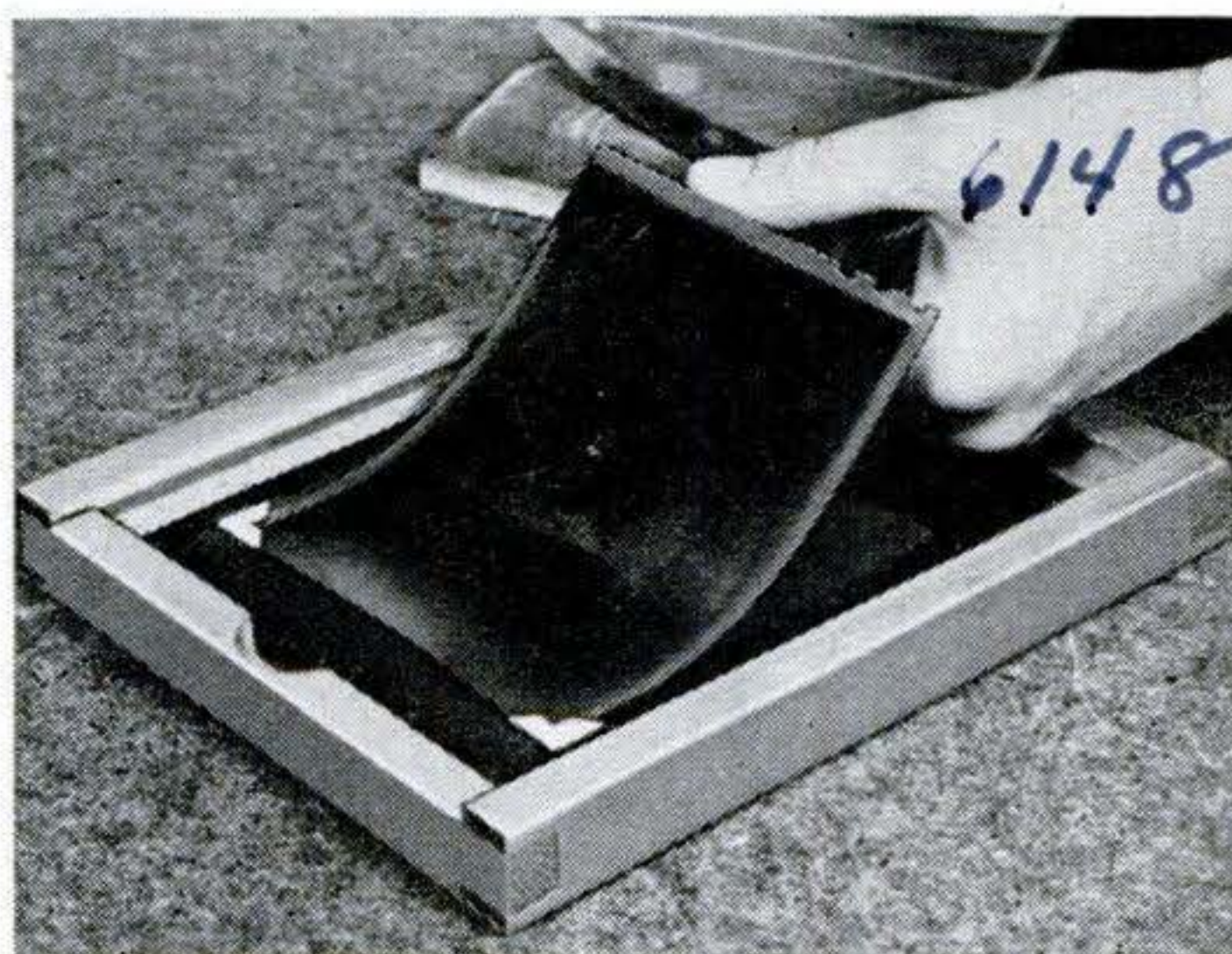


THIS burglar alarm is easily installed or switched from one window or door to another, or used by campers to signal the approach of strangers. It's made of a doorbell and a three-cell flashlight; either can be restored to its original service in a minute. Two spring-brass contacts and the bell are screwed to a piece of wood which is fastened to the flashlight with a rubber band.

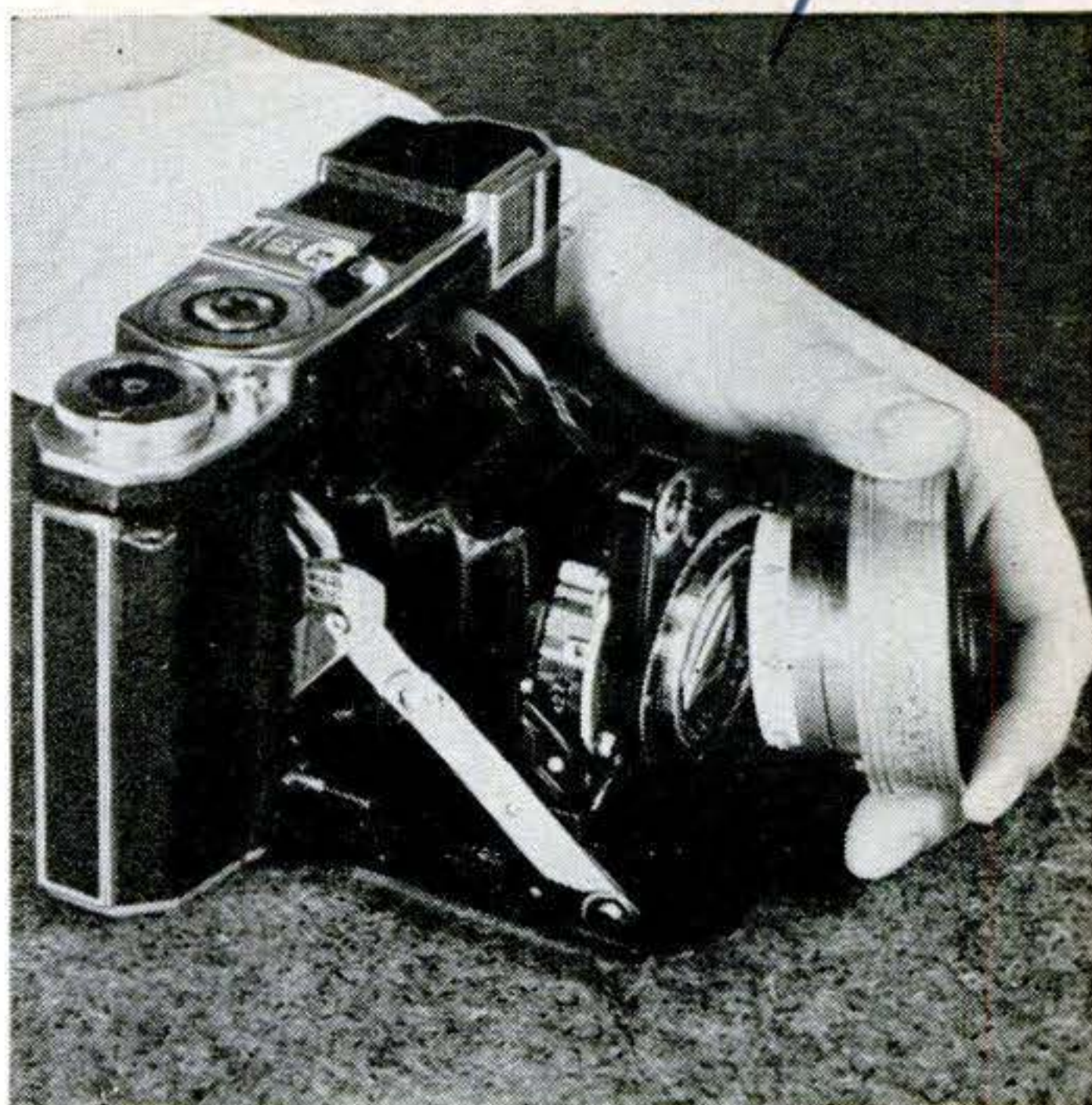
Break the glass off a burned-out flashlight bulb and solder a wire to each of the filament supports. Tape the base and screw it into the socket. A wood separator, tacked to the trip string, holds the contacts apart.—
Ken Murray, Colon, Mich.



Sound Track Added to Home Movies. No processing is needed to synchronize a sound track directly onto already developed 8- or 16-mm. home movie film with the Filmgraph®. The machine uses a fine jewel to cut a sound groove .002" wide on either edge of black-and-white or color film. Played back through the Filmgraph and a standard silent projector, the film then becomes a talkie. A mike and speaker are included in the outfit. The maker is Miles Reproducer, Inc., New York City.



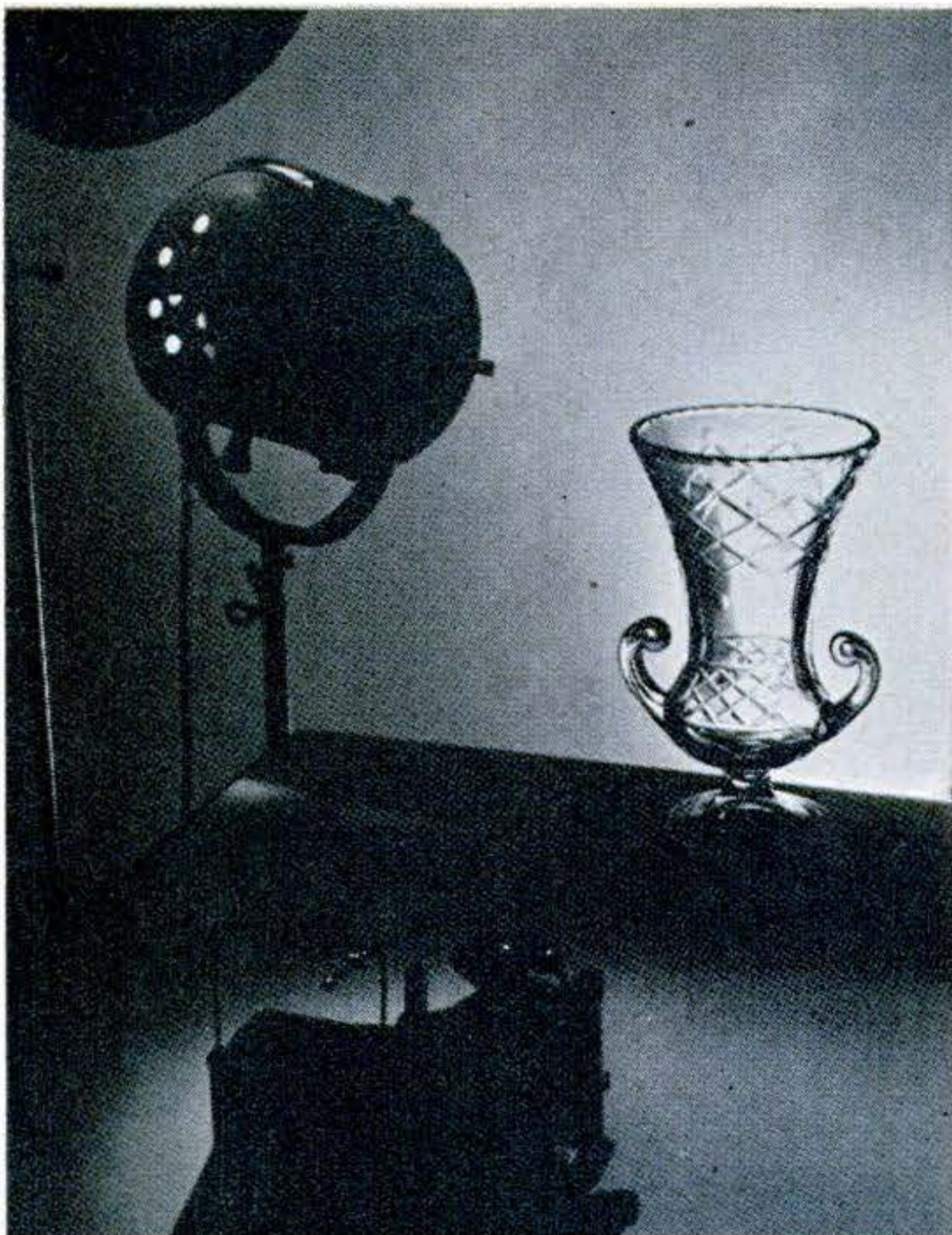
Stops Prevent Paper Slipping. To keep paper and negative from slipping out of alignment when the back of the printing frame is put in place, glue two photo-mounting corners to one end of the mask.—*H. W. Moore, Binghamton, N. Y.*



Distance Scale on Lens Shade. With cameras that have the distance scale engraved in the rim of the lens mount, settings cannot be read with a lens shade or filter holder in place. You can easily overcome the inconvenience of having to remove the accessory each time to read the setting. Simply letter duplicate distance scales on narrow paper collars and attach them to the flange of the shade or holder by bands of clear cellulose tape.

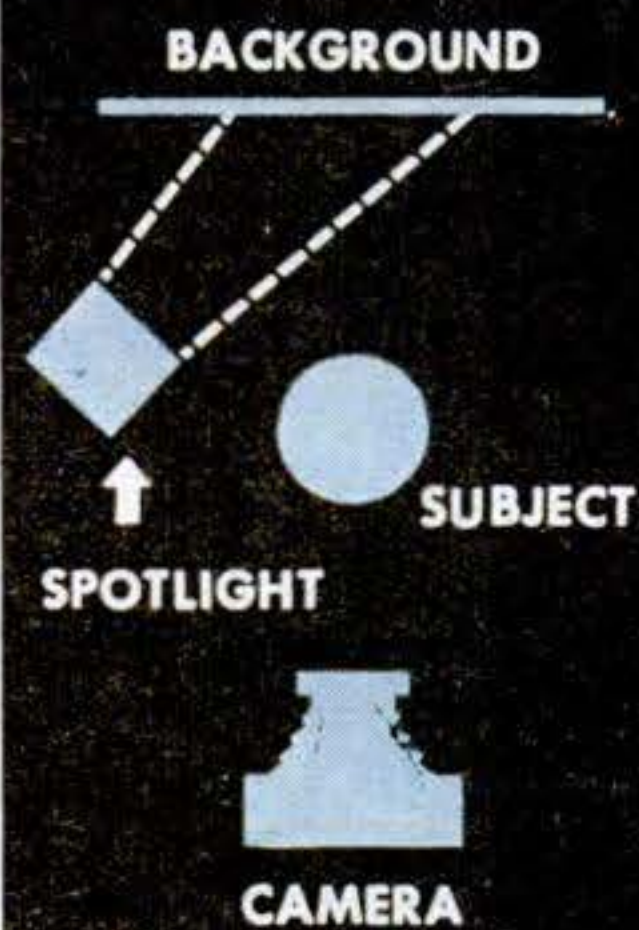


Filter Factors on Lens Shade. You'll always have accurate data handy if you attach a small chart of filter factors to your filter holder or lens shade as shown in the photo. Fasten the chart on with rubber cement or cellulose tape.



**DARK-OUTLINE
LIGHTING**

**BRIGHT-OUTLINE
LIGHTING**



Two lighting setups are basic. Other lights can be added as needed. For the dark-outline

shot, left, a 500-watt spot and 150-watt bulb in a reflector were placed as in the top photo.

How to Photograph Glass

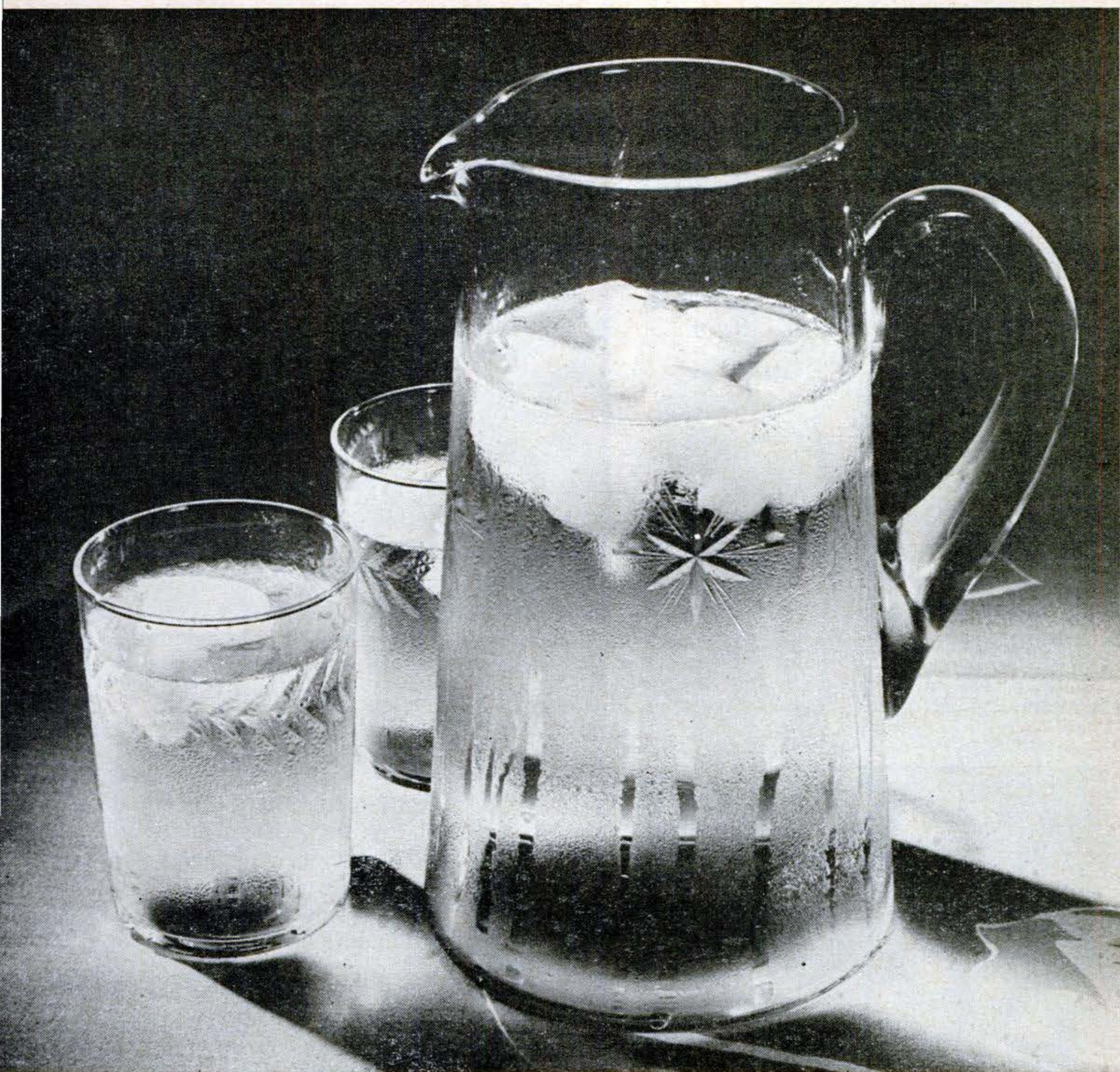
Ordinary lighting on glassware means flare, reflections, and headaches. These two special techniques help get rid of the grief.

By Kenneth M. Swezey

HAVE you ever tried to photograph your wife's prized glassware or some plastic masterpiece you've spent hours in fashion-

ing? Did your final prints contain a couple of glaring light reflections, with the object itself practically invisible?

One experience like this is enough to show you can't use lighting methods that are per-



Backlighting gives realism to this sparkling example of the bright-outline technique. Three

lights were used, two behind to the left and right and one in front to lighten the shadows.

fectly suitable for portraits—one light, say, at the camera and another above and to the side.

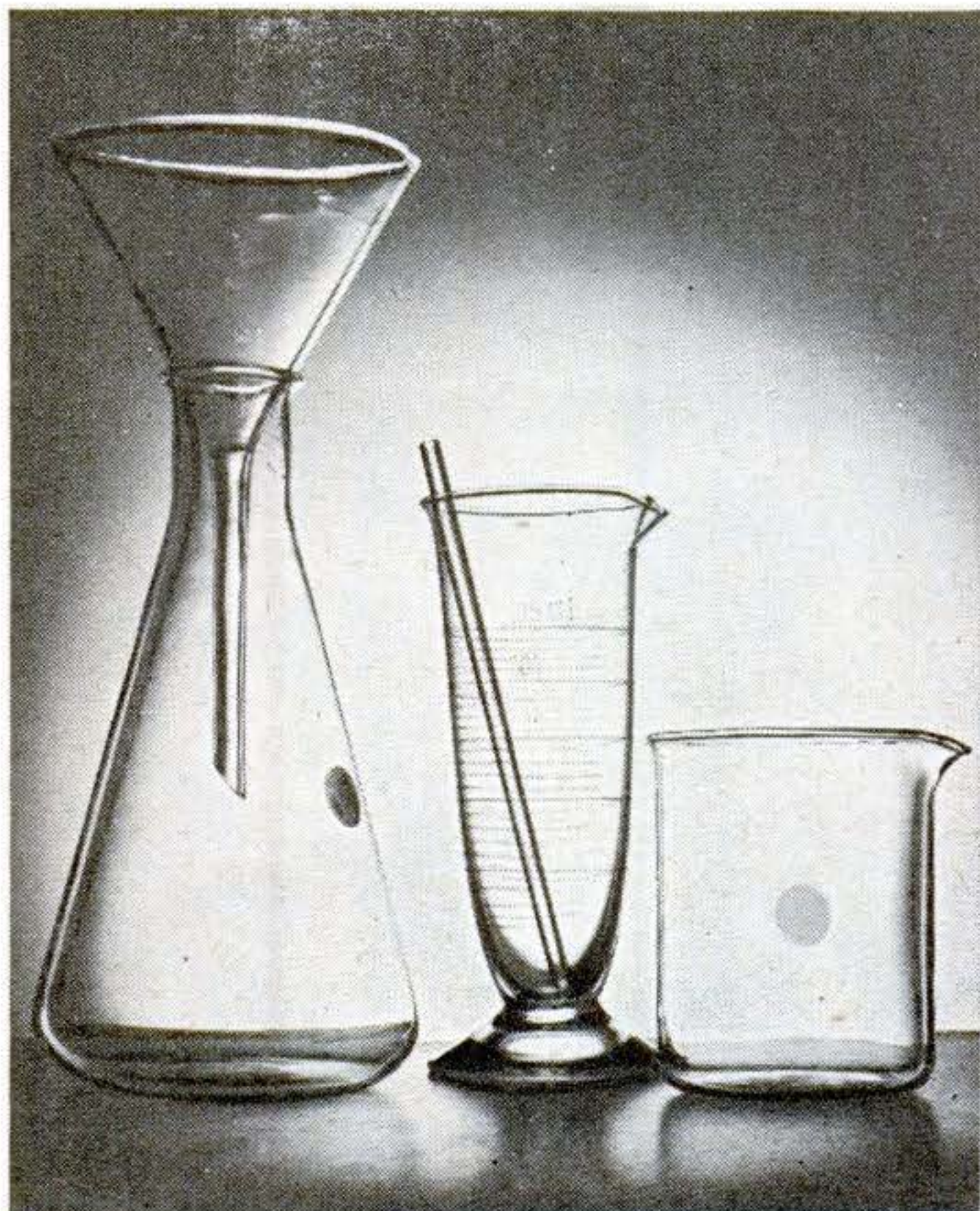
Why is this so? Because you see colorless, transparent objects—and the camera sees them—by more subtle means than you see opaque, or lightproof, objects. You determine the shape, texture, and tone gradation of an opaque object merely by light reflected from its surface. On the other hand, you observe the characteristics of glass, plastics, and transparent liquids by a complex interplay of light and shadow caused by reflection and refraction.

To do a better job of shooting transpar-

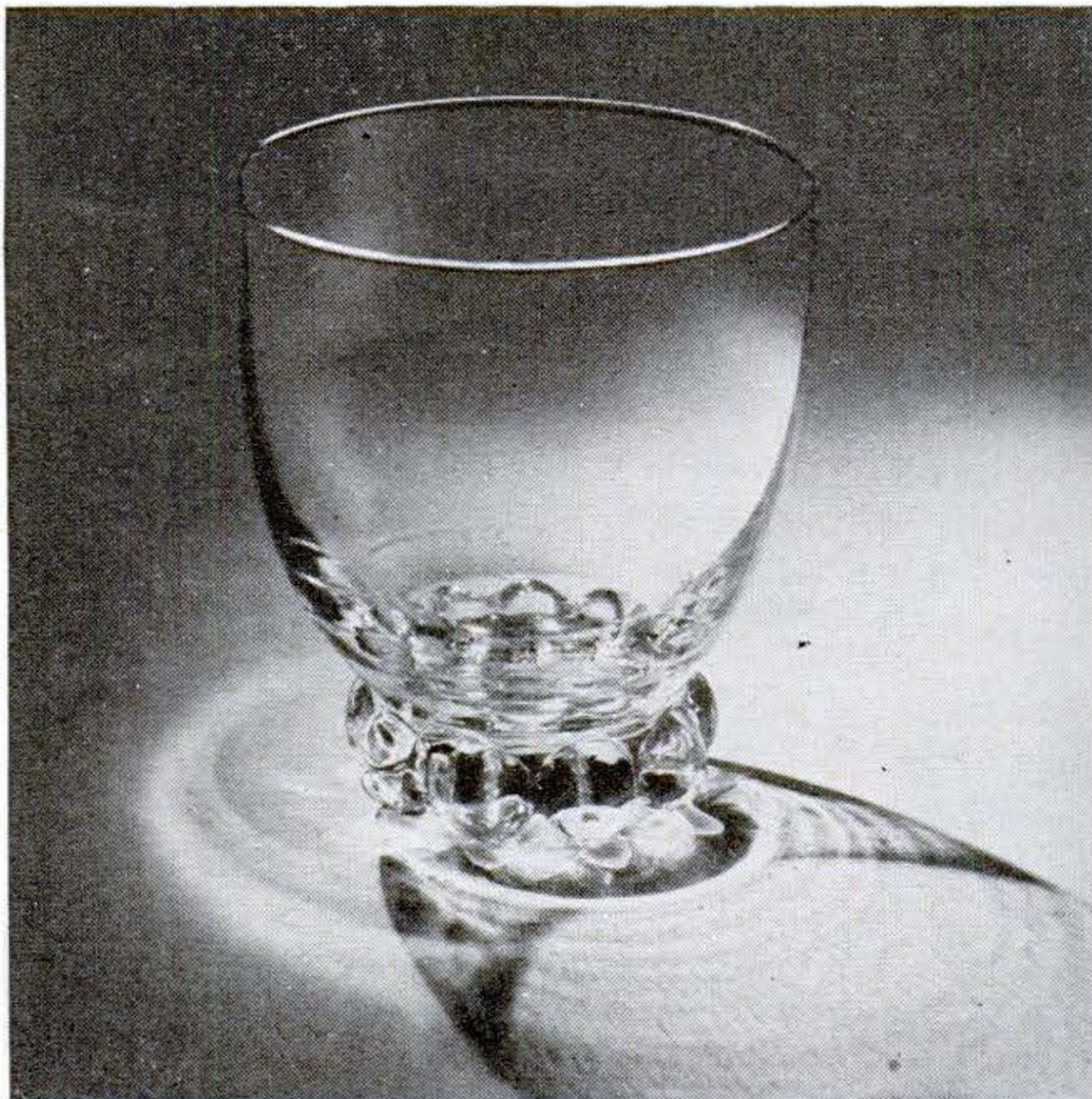
ent things, you don't need special—or more—lighting equipment. Usually you can do with less. However, you do need a different approach, an observing eye, and plenty of patience. Practice with the two lighting methods suggested in this article should make the way a lot easier.

The first technique produces a dark outline. It's an effective and dramatic way of showing the form of undecorated glassware and the design on cut and etched glass. The width and relative blackness of the dark line may be varied to suit your taste.

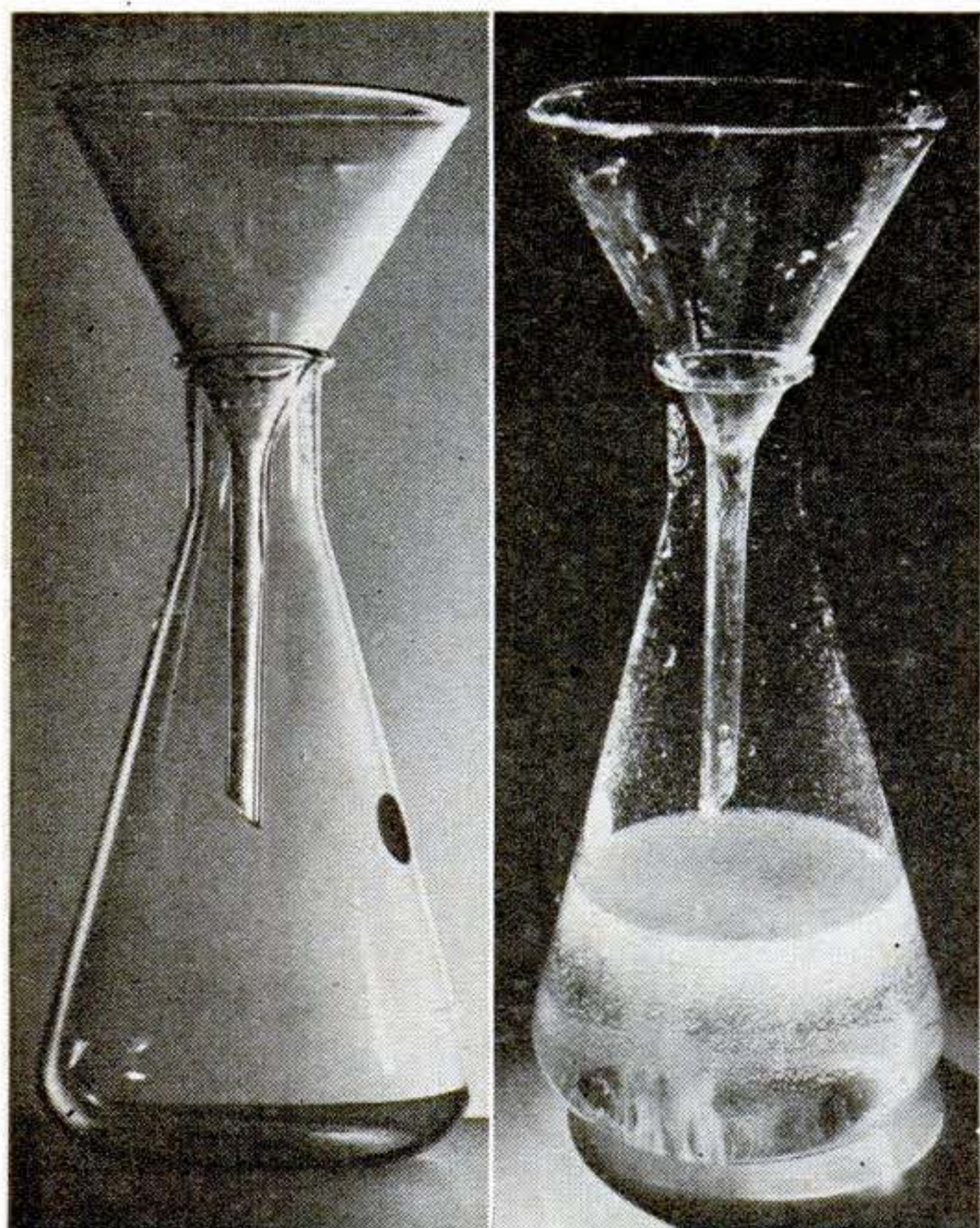
This technique is simple. No light is aimed directly at the object. A single spot, a



Chemical glassware is an excellent subject for the dark-line technique. It shows outlines and graduations distinctly. Sometimes you can use it to show changes during chemical reactions.



A **200-watt spot** provided the only lighting in this case. It was located above and behind to the left. Notice how the projected shadow and light rings add interest to the picture.



Contrasting examples of the dark (left) and bright-outline lighting methods are seen here. The effect at the left was produced by placing a spot at left side of subject and directing it diagonally against a white background at the extreme right. Backlighting with two spots gave the result at the right. When the subject contains a transparent liquid, as in this case, the bright-outline method is usually better.

flood, or a combination of both is directed at a white background 24" or 36" behind the object. You can get endless modifications of the basic dark line by changing the area and intensity of this patch of light by moving it from side to side or up and down.

If you want a thin dark outline, spread the background light over a large area. To broaden the outline, reduce the circle of light. For a softer effect, use a floodlight; for more contrast, a spot. To photograph the vase on the first page of this article, an ordinary 150-watt bulb was placed in a flood reflector and its light superimposed on the light from a 500-watt spotlight. This softened the shadows.

If you want to change the relative width of the dark line on the two sides of the subject, just shift the circle of light sideways on the background.

But here's a point to remember. If the rounded glass you're photographing is solid or filled with a clear liquid, you must move the circle of light in the opposite direction to produce the same dark-line effect you get with empty glassware.

For example, suppose you're photographing a plain glass tumbler. While it's empty, the dark line will be thinnest on the side where the background is most brightly il-

luminated. But if you fill it with water, the situation is reversed.

The reason? When filled with water, the rounded tumbler refracts light like a lens. The same thing happens with a rounded solid glass object. Photos No. 3 and 4 to the right on this page are examples of this type of lighting. In each case, the circle of light was shifted to the right. In No. 4, notice the light area at the top right where there's no water.

When using the dark-line method you can give glass objects greater roundness by narrowing the background light and placing it a little off center. The illusion of roundness is also increased by shooting from above or below.

A second method of lighting glassware is in sharp contrast to the first. Instead of a dark line, it produces a bright outline. Such lighting often produces more realistic results, but just as dramatic. It depends on light reflected from surfaces and edges.

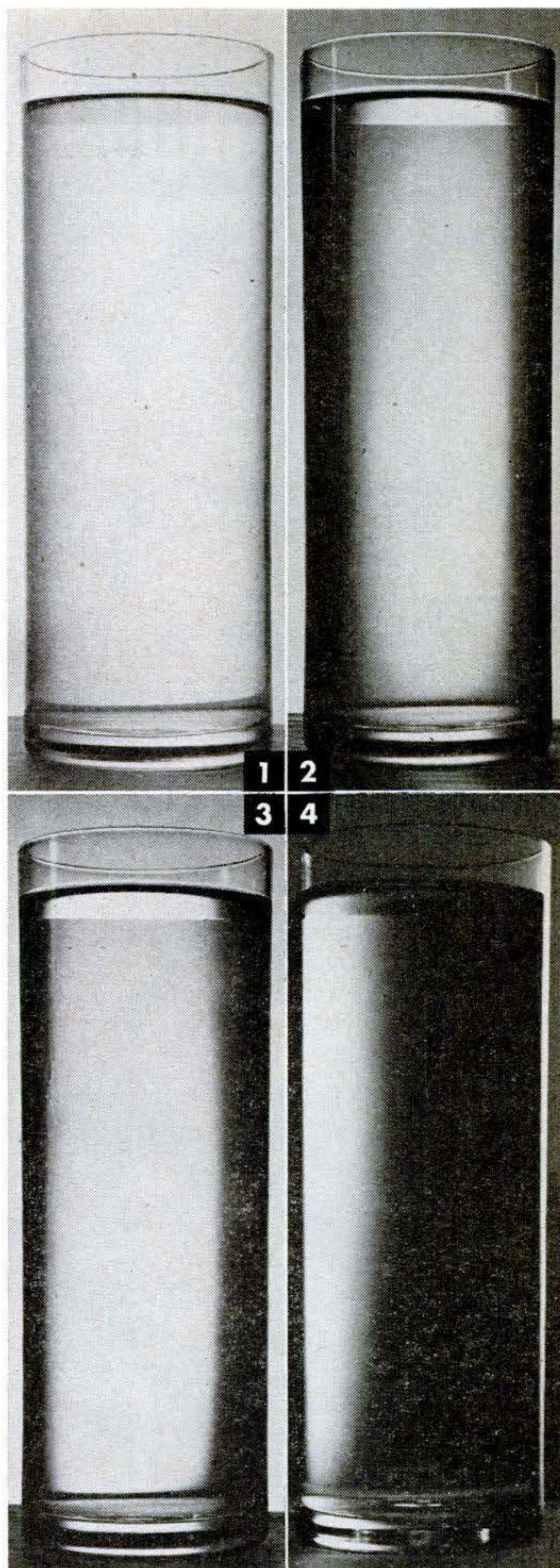
Usually called backlighting, this technique employs a main light directed through the glassware from a position above, behind, and to one side. A spot is preferable for this light. Place it carefully to highlight the top edge and also cast a pleasing shadow pattern through the object onto the table. If other edges or side surfaces of the glass remain invisible, light them with small spots or floods.

The bright-outline technique is especially useful when the glassware contains a transparent liquid. The photograph of the pitcher and two glasses on a preceding page are an example of this type of job.

Three lights were used. The pattern light was a 500-watt spot, behind, above, and to the left. A 200-watt spot slightly behind and to the right outlined the handle. Otherwise it would have blacked out. A 150-watt bulb in a reflector was placed above and in front to lighten the shadows.

The latter emphasizes another good point. When it's necessary to use lights in front of glassware, place them high or low to avoid direct reflection.

Before photographing glass or similar objects by backlighting, be careful to clean them thoroughly. If you don't, every little speck of dust and dirt will show. Wash them in a solution of soapless detergent. Then rinse in clean water and dry with a lintless cloth. Even with this care, specks are apt to remain. These usually can be etched off the negative or spotted on the print. **END**



Rounded vessels filled with a clear liquid act as lenses, concentrating light from the background when the dark-line method is used. To get a thin dark line (1), a flood was used to spread light over the background. The narrow beam from a spot widened the bands (2) while shifting the spot to one side altered their relative widths (3). Directing the background light far to right gave the effect in No. 4.

Radio-Building Hints for the Beginner



The best way to learn radio building is by building radios, but these tips may smooth your first steps.

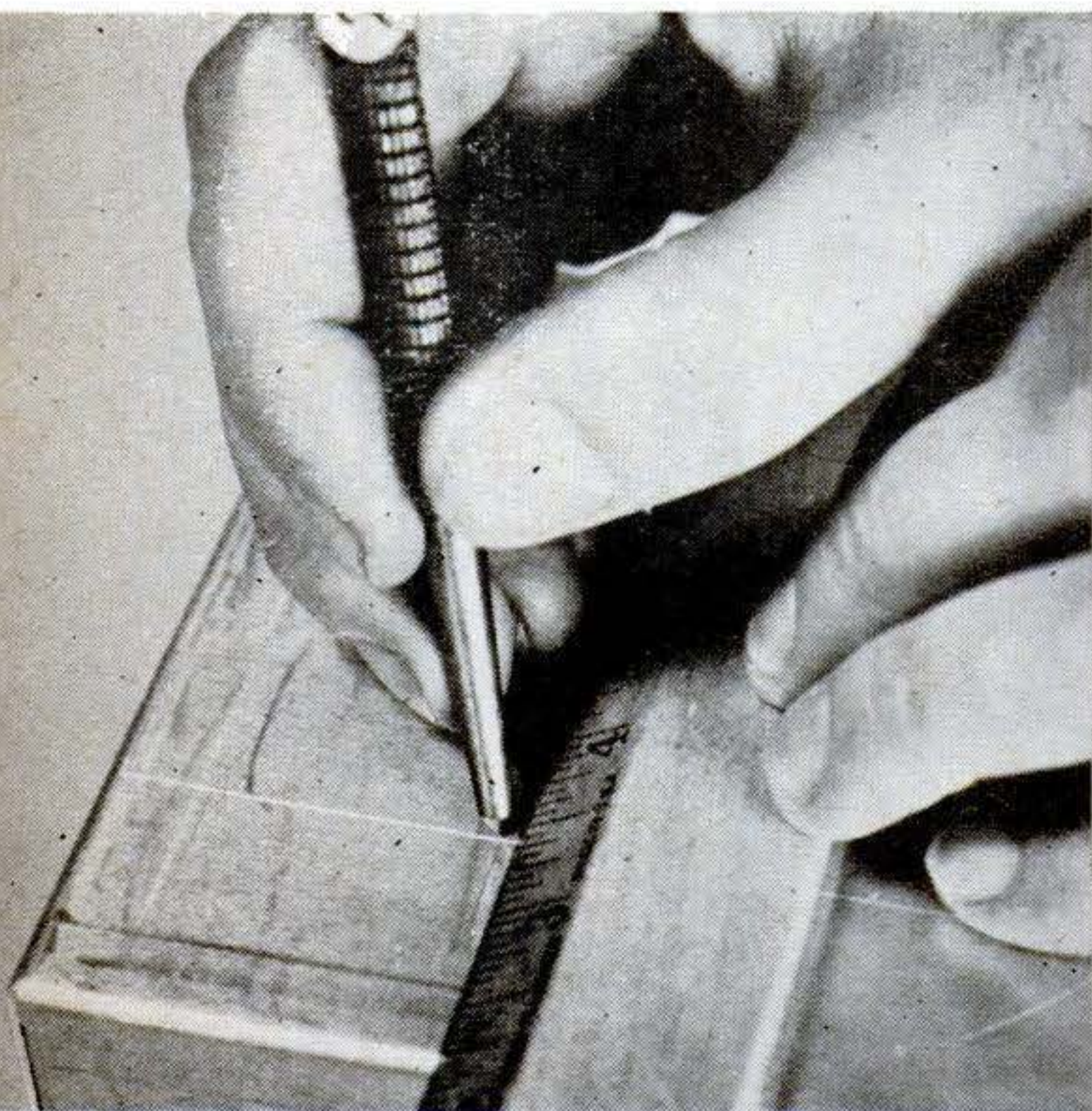
By Frank Tobin

MANY craftsmen who have been bitten by the radio bug have discovered that the hardest thing about getting started in radio is—getting started. Right at the outset you have to answer a hundred practical questions that crop up even in the simplest project. Common sense can answer most of them, but a few pointers may help you past the first bottleneck.

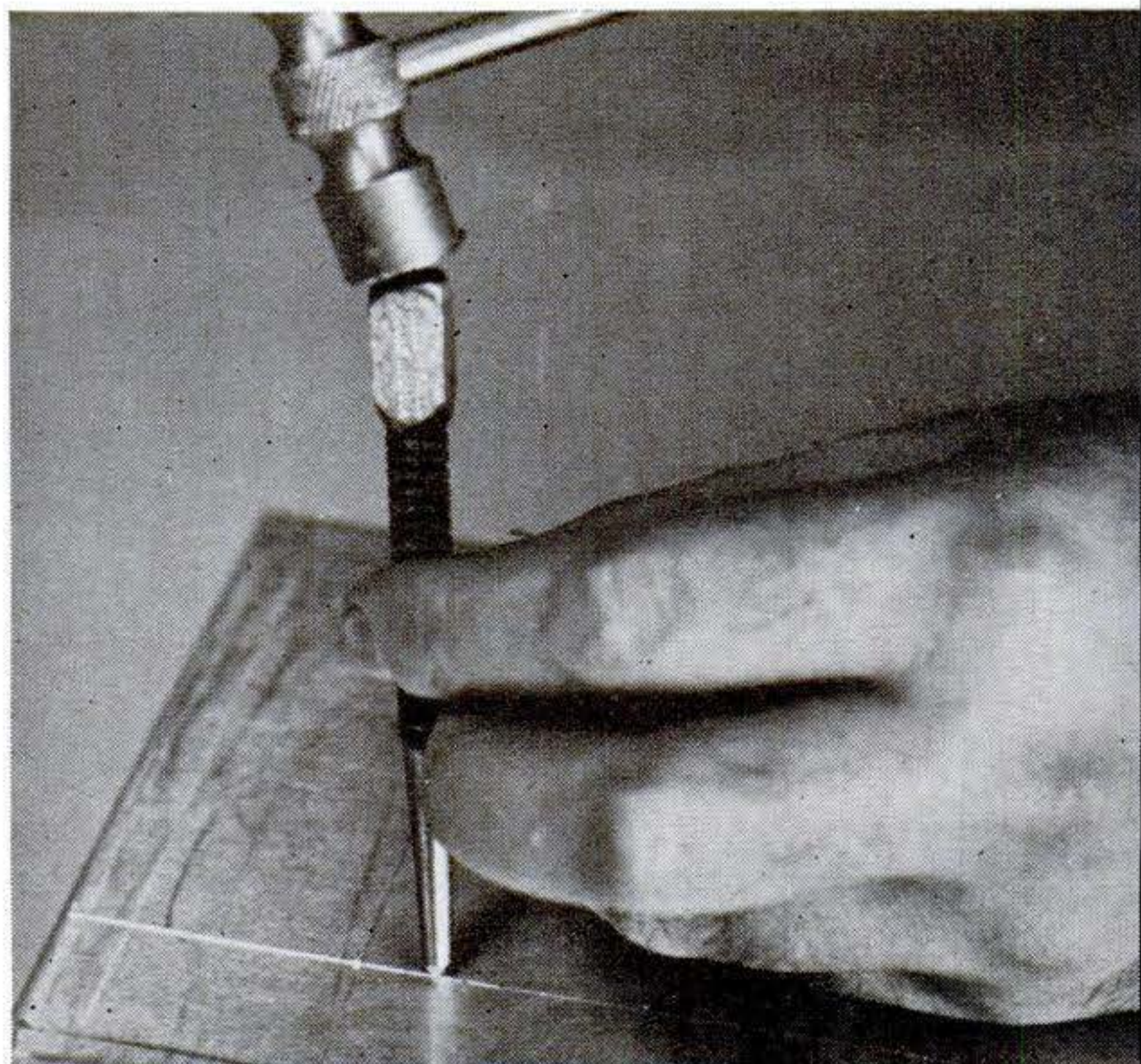
3965

Quite literally, the chassis is the foundation of any electronic gadget. It's the place where you hang all the parts. You can bend it up out of tomato cans, cut it from a breadboard, or use the orthodox kind that you buy in radio stores. Most of the latter are made of either aluminum or steel, generally about 1/16" thick. They come in a variety of sizes and finishes.

Aluminum, of course, is easier to work with than steel, particularly if you have only



A ruler and a sharp punch are used to mark a chassis. For experimental layouts that may have to be erased, use soft or colored pencil.



Where a hole is to be made, hit the punch a sharp hammer blow. The indentation guides the drill, helps get the hole exactly on center.

a hand drill. With an electric drill the difference isn't very great. You can use carbon-steel bits with a hand drill, but high-speed drills will last longer if you have a heavy-duty electric drill.

Drilling the holes is an easier matter than deciding *where* to drill them. Tube sockets and coils especially must never be placed haphazardly. They have to be located and oriented so as to keep the leads as short as possible. Not all wires can be short, of course, but they aren't all equally important. The critical ones are those going to plates and grids. From the diagram or a tube manual you can easily figure which way to turn a socket or IF transformer so that the leads will remain short. Screen-grid and B-plus wires are next in importance. Keep them short if you can, but don't worry if they have to stretch a bit. Heater, ground, and AVC leads practically don't count in the shortness sweepstakes.

Should you find that the grid leads in an audio or output stage have to be long, use shielded wire and ground the braid to the chassis at some point. Good examples are the connections to volume or tone controls. Do not use shielded wire in radio-frequency stages, as the added capacity of the shield may easily throw off the alignment of the coils and tuning condenser. And if any grid wire has to cross one that goes to a plate, make sure they do so at right angles.

Wherever possible, group components which perform similar functions. The RF and IF parts can go on one section of a chassis, the audio and output stages are gathered in another, and the rectifier and power-supply pieces occupy still a different corner.

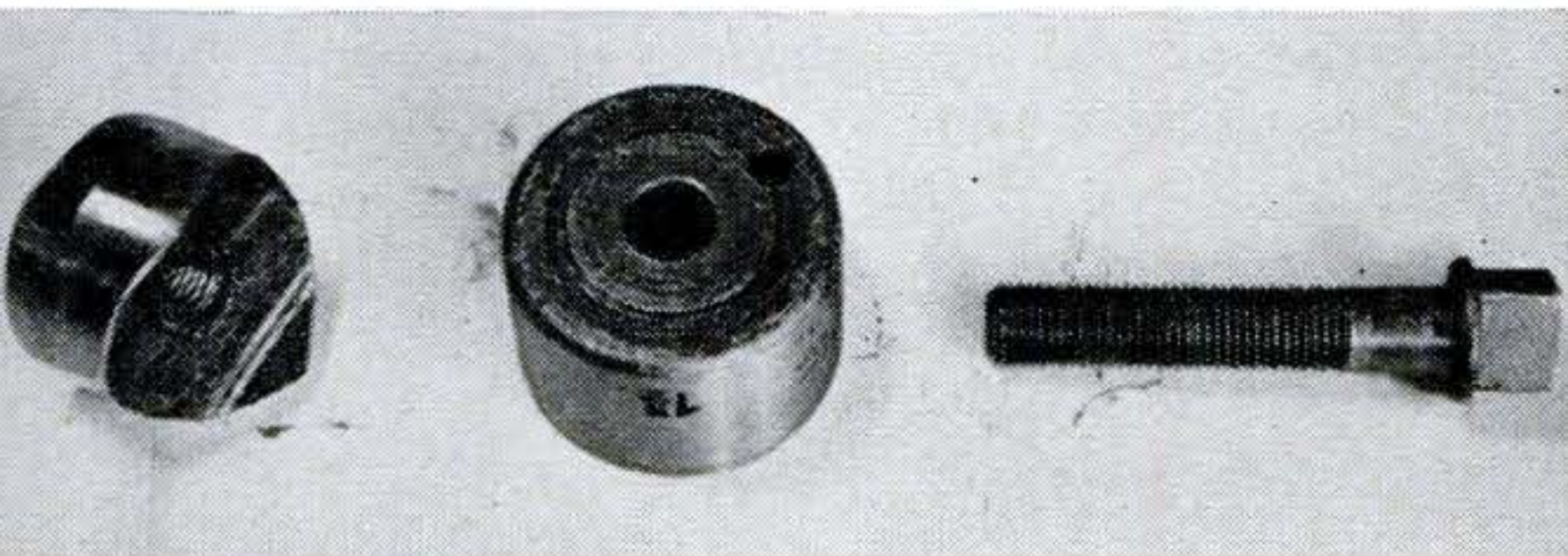
Once you've decided where each of the parts is to go, mark the chassis for drilling with a soft pencil or a sharp-pointed tool. At the spot where a hole is to be drilled, make a punch mark that can serve as a pilot for the drill. Since the three holes for a tube socket (two hold-down screws and that for the socket opening) must line up exactly, marking and drilling require care.

Small holes are easy. All you have to do is select a drill of the proper size. Larger ones for tube sockets and the like are another matter. There are three common methods for making such holes.

You can either enlarge a smaller opening with a rat-tail file, use an adjustable hole cutter in a drill press, or employ a chassis punch. Punches are made in all the common socket sizes; the three that take care of most work are $\frac{5}{8}$ ", $1\frac{1}{16}$ " and $1\frac{1}{4}$ ".

It is difficult to visualize in advance all the holes that may be needed, but drilling others after some parts are mounted may endanger those parts. Why not drill a few extra holes, especially in strategic locations?

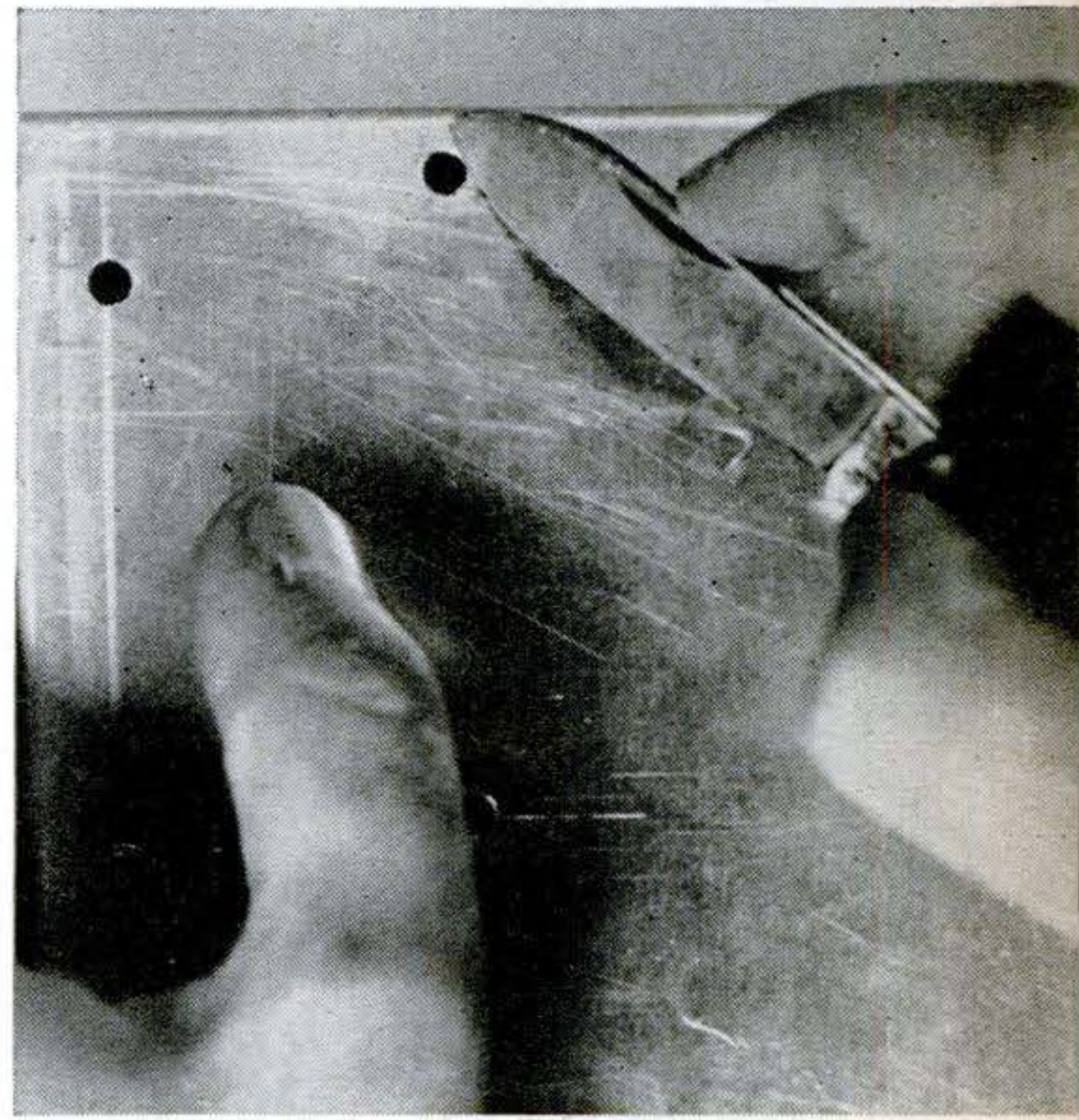
Remember, for example, that leads from



A **chassis punch** consists of a two-jaw cutter, left, a die, and a machine bolt. A separate punch is needed for each different hole size.



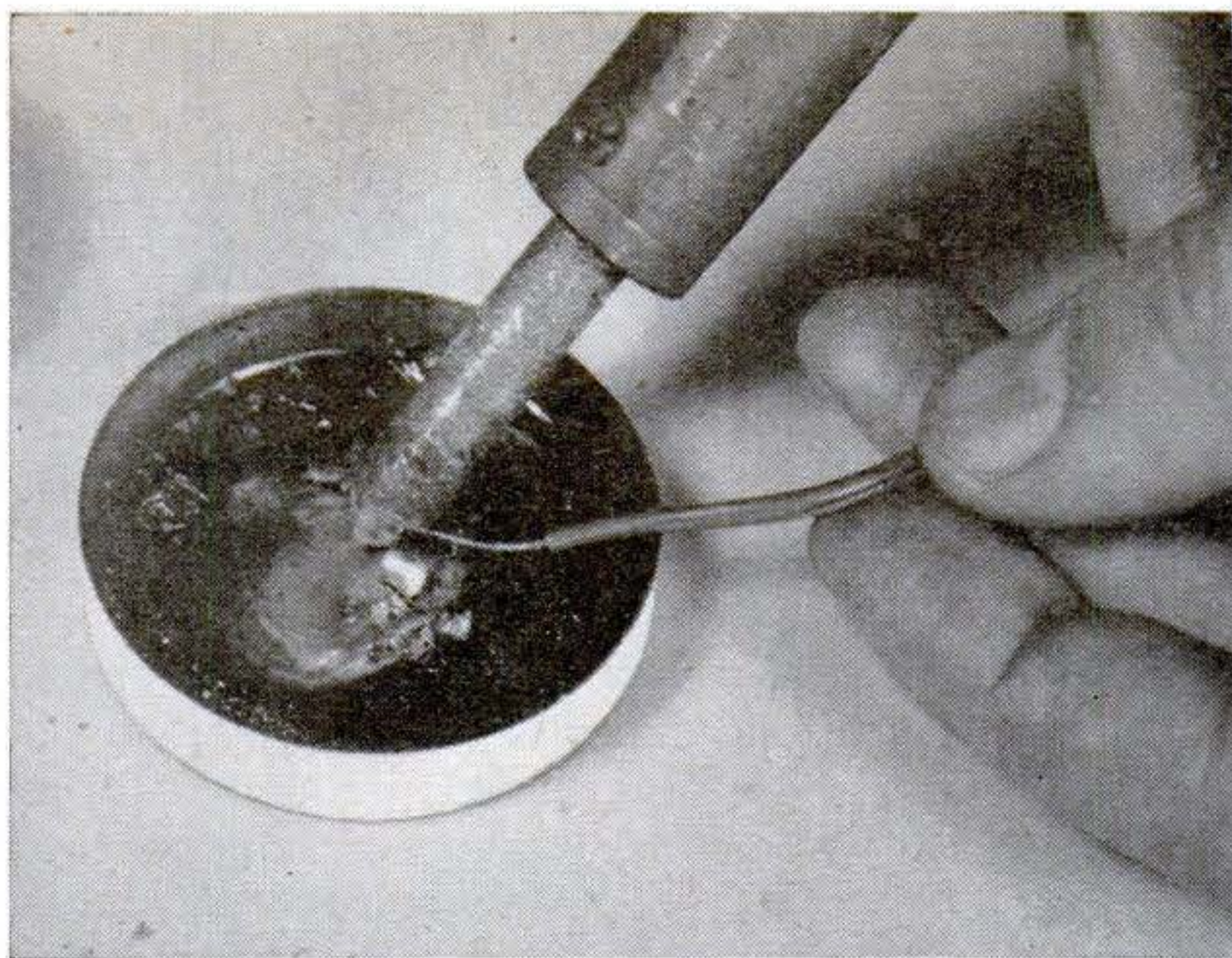
Drawing up the bolt with a wrench brings the cutter and die in contact with the chassis and shears out a clean, precise socket opening.



Any burred edges that are left after drilling—especially in aluminum—should be removed with a file or a heavy knife blade.



Copper wire solders best when it is tinned. Best bet is to buy it that way, but you can tin the ends yourself by scraping them clean



and dipping them into rosin flux paste. Put an end on a metal plate and run a thin coat of solder over it. Melt off any excess.

a transformer or choke can't get to the underside of a chassis through solid metal. A $5/32''$ or $3/16''$ hole is about right for passing a wire through the chassis. You need an opening, also, when you use a tube that has a grid connection brought to a metal cap on top. And for each gang of a tuning condenser there has to be some way to get to the stator (fixed) plate terminals. If the condenser has lugs on the bottom, drill over-

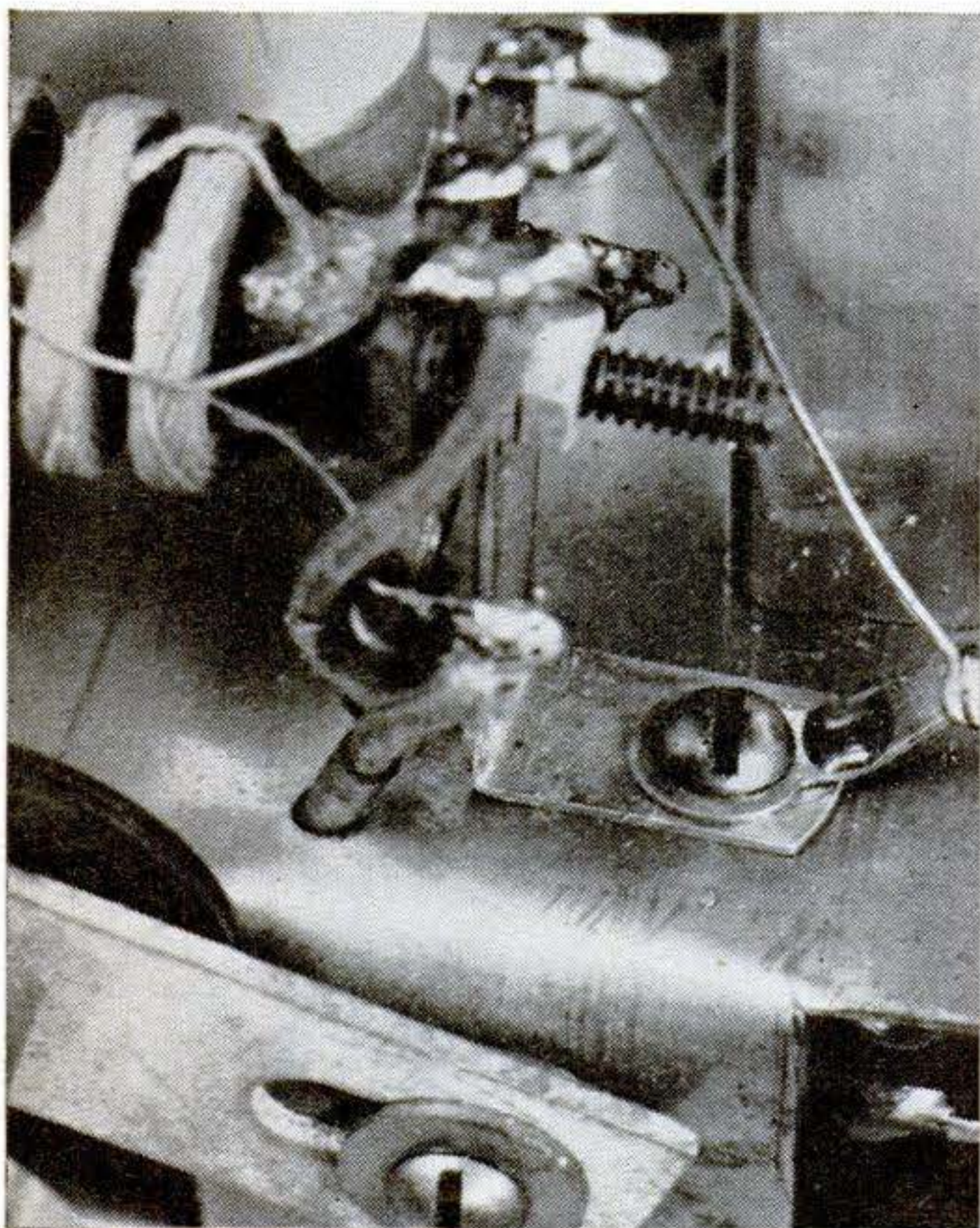
size holes—say $1/2''$ to $5/8''$ —so that neither the lug nor the connecting wire can touch the chassis.

Once you have all the holes drilled and the parts mounted, you can get down to the serious business of wiring the set. It is usually advisable to make all filament or heater connection first. Take care of the cathodes next, then go back to the RF stage and work along, in order, to the rectifier.

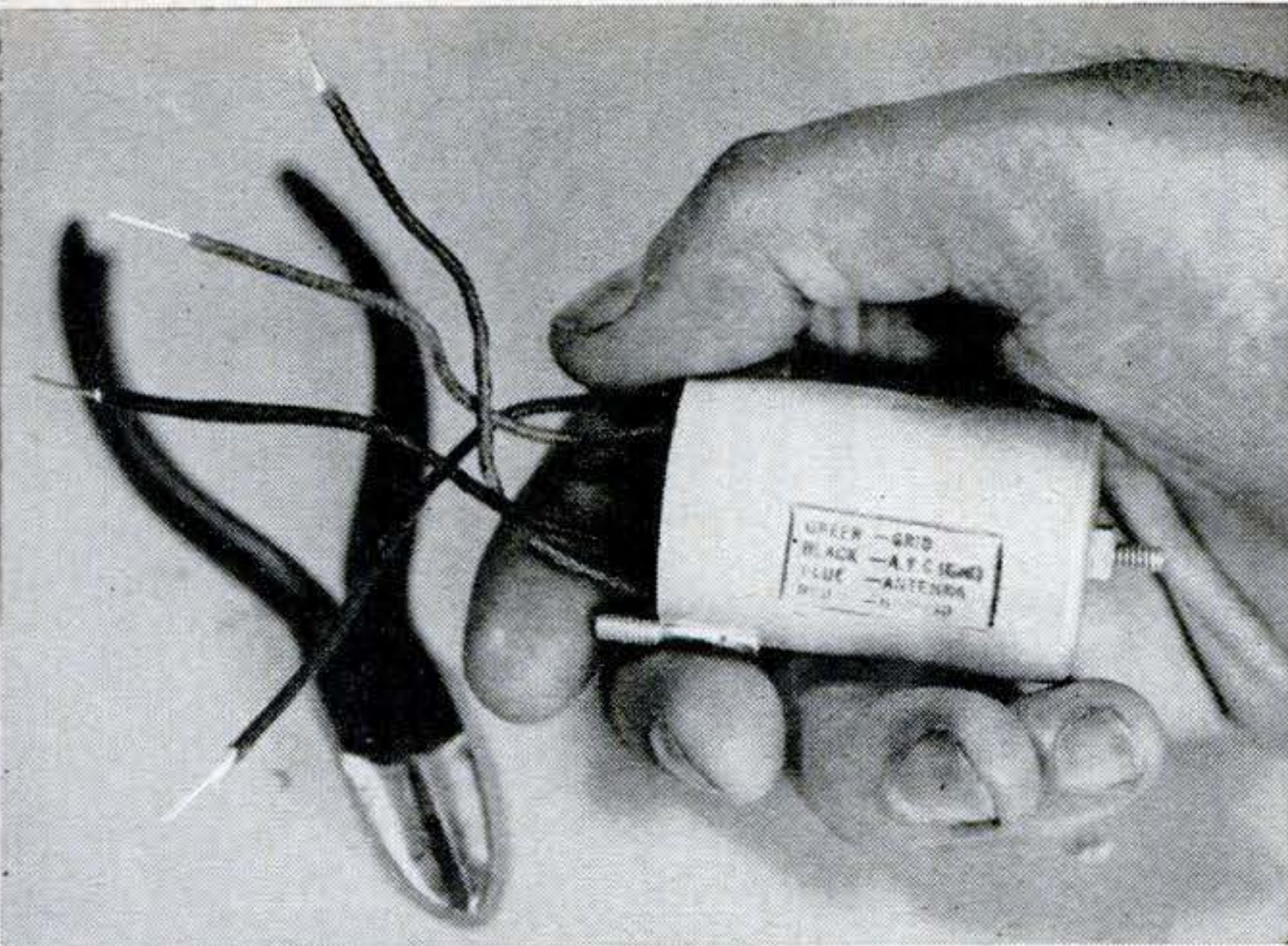
In AC receivers where heater voltage is obtained from a filament winding on the power transformer, twist the leads and ground the centertap of the winding. This helps to reduce hum pickup. If the winding has no centertap, ground one of its two leads and one of the heater pins on each tube socket directly to the chassis. The other transformer lead then goes to the remaining heater prongs. Always use stranded wire with good insulation; it withstands twisting and bending a good deal better than solid wire.

While stranded wire is recommended for heater connections, a solid wire—preferably with insulation of the “push-back” type—has advantages for B-plus and plate leads. Being less flexible, this wire can be bent up out of the way and will stay where it is put.

In actual practice you will find that you don't need very much wire to hook up a set. Many components are sold with their own leads, which are almost always ample for the connections that have to be made. If they aren't, the chances are that something is wrong with the placement of the parts. Most often it will be necessary to cut these



A soldering lug, held down by a screw that is used to fasten some other part to the chassis, provides an excellent ground connection.



Many components can be purchased with tinned wire leads, all ready to solder into the set. Push about $\frac{3}{8}$ " of insulation back from end.

leads down to size. When one isn't needed at all, cut it off short.

Much the same facts apply to small parts such as resistors, mica and paper condensers, and plate chokes. These usually come with "pigtail" leads which are stiff enough to support their weight. If a pigtail lead has to come near or cross a bare wire, or is in any other danger of grounding or shorting, slip a length of "spaghetti" tubing over it for insulation.

To provide anchoring points for a wire that goes to ground or for two or more leads that come together, use soldering lugs and terminal strips. The soldering lug is a little metal tab with a hole at each end. Slip one hole over a machine screw that is being used

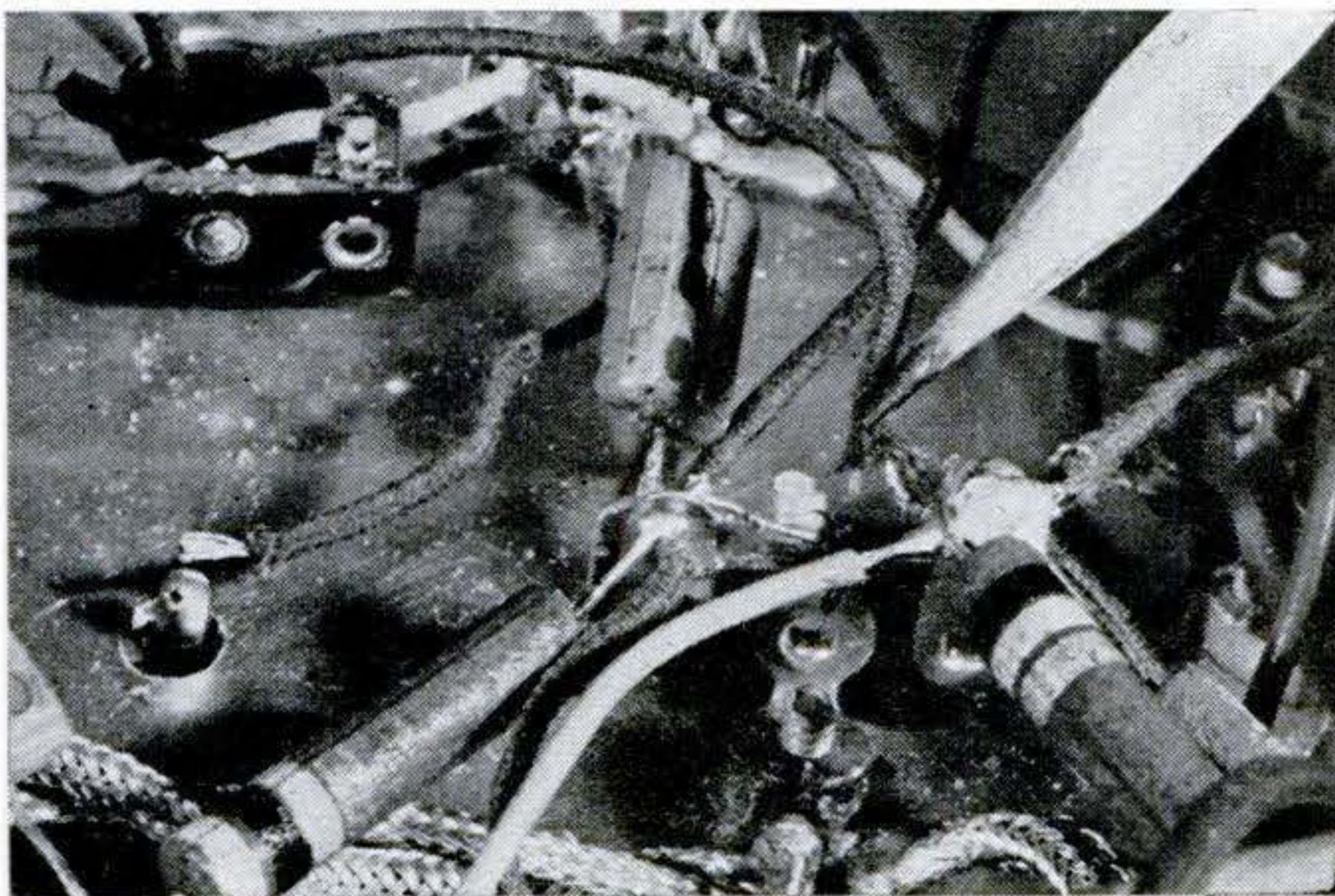
to hold down some large part, and clamp it with an extra nut. Wires that are soldered to the other hole will then be in good electrical contact with the chassis.

When joining unground wires—as several B-plus connections that come together—use a terminal strip or lug. These consist of one or more eyelets mounted on a fiber strip. A leg is provided for bolting the strip to the chassis, but the eyelets to which connections are made are insulated from all other points.

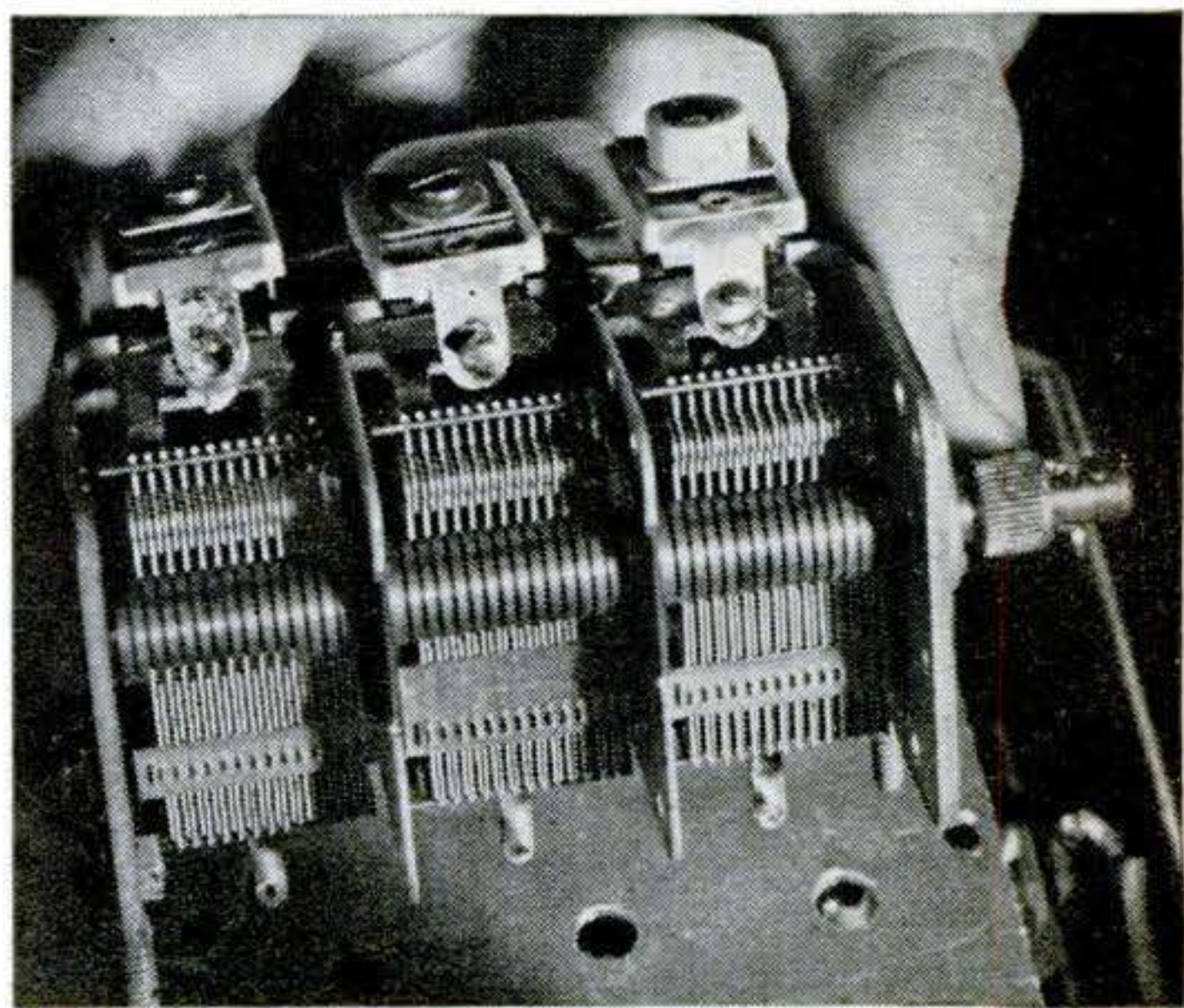
Copper wire that has been "tinned" (that is, cleaned and finely coated with solder) is best for radio work as it allows faster and more secure soldering. Try to buy tinned wire and parts with tinned leads, but if you can't, here's how to fix them up yourself. Cut off or push back the insulation to a distance of about $\frac{3}{8}$ " from the end, and clean the copper with a piece of emery cloth. Stick the cleaned tip into a can of rosin flux paste and place it on a small metal plate. Bring a hot iron and a strip of solder into contact with the end. A thin coat should adhere to the wire. Run off any excess with the hot iron.

Never use acid-core solder in radio work. Acid can corrode the connections, and if any should remain between socket prongs or other critical points, it could act as a leakage path for the busy electrons. Plain and rosin-core solders are fine, and a can of rosin paste is handy since even the cored solders can stand some extra flux. Excess paste on a joint need not be wiped off as it can't do any harm. In making soldered connections, heat the joint and let the *joint* melt the solder.

END



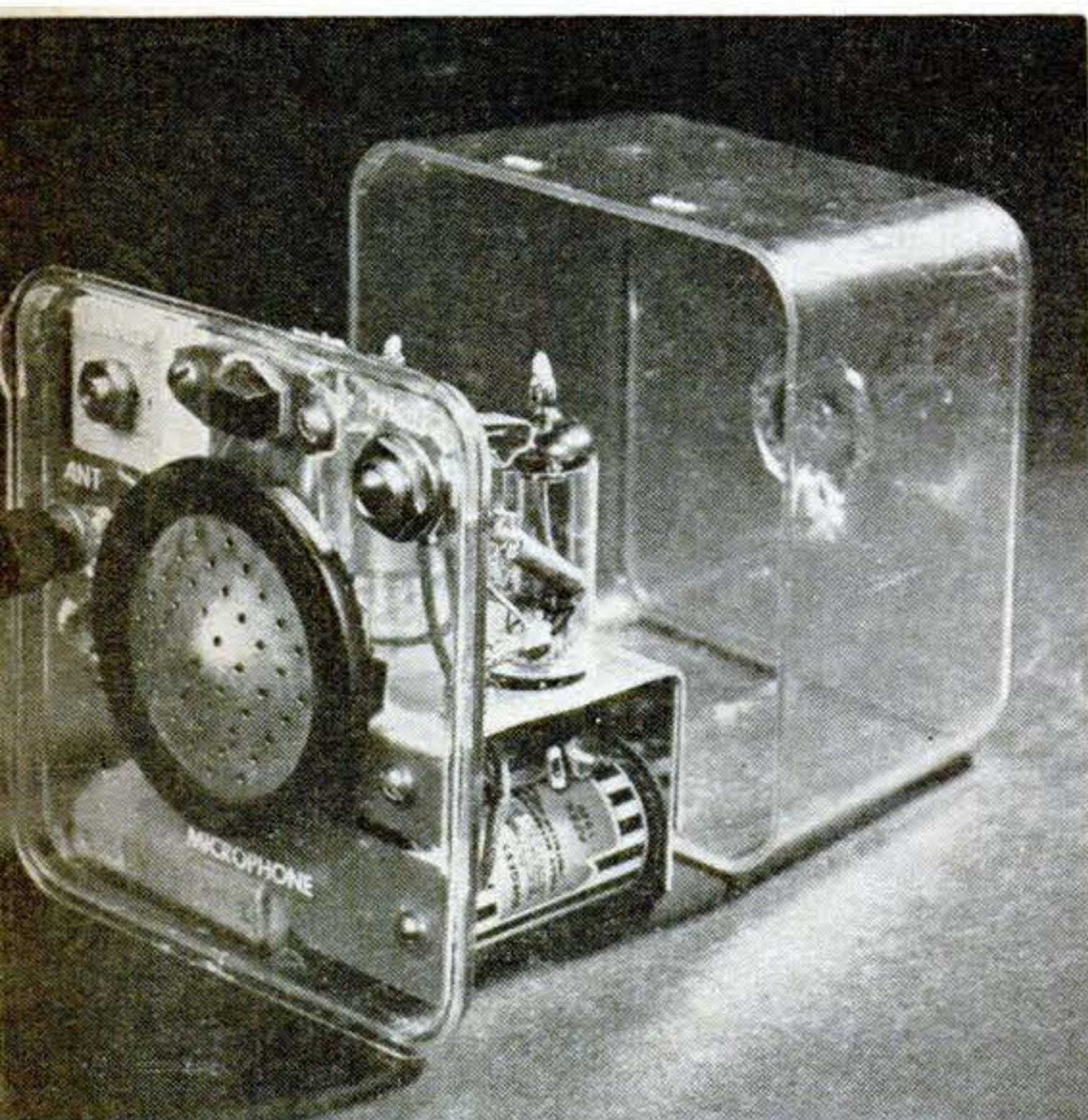
Terminal strips make fine anchored meeting points for ungrounded wires. The pencil points to one; another one is in the background.



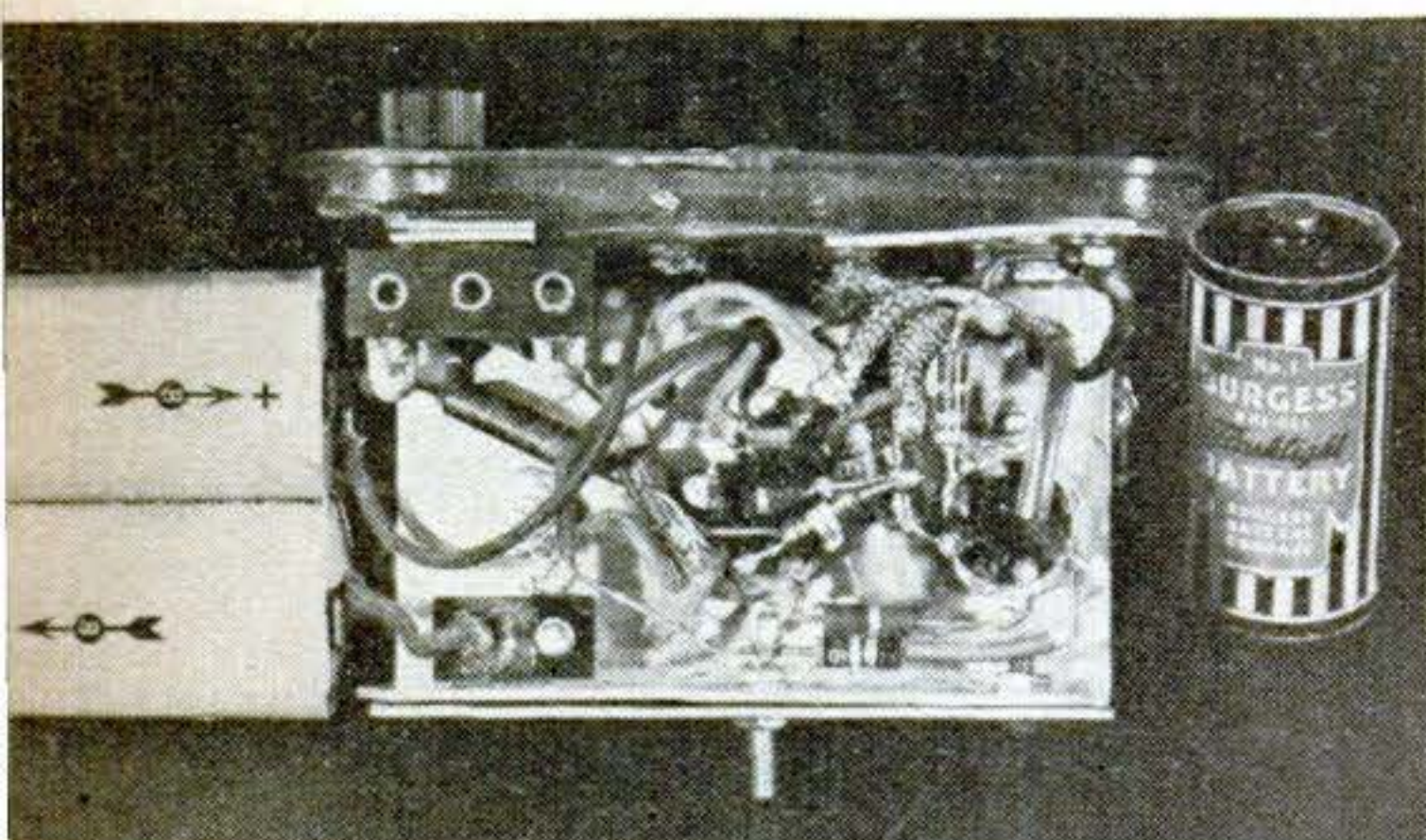
Try to visualize all necessary holes and drill them in advance. One is needed to clear the stator lug on each unit of a ganged condenser.



This complete miniature broadcasting station will fit comfortably in the palm of your hand.



The cartridge from a crystal mike, with the rubber cushion left on, is set into the panel.



Wiring shouldn't be difficult. Just don't let it spread out. Batteries fit under the chassis.

Wireless Mike Puts You on the Air

5304

TALK into this tiny handful of radio transmitter, and your voice will come out of the nearest radio. It can be tuned to any quiet spot near the high end of the band. When held a few feet away from a receiver, this wireless microphone works without an antenna. For greater distance a hank of wire is needed to radiate the signal. If you arrange it right, your party guests don't even have to know that the voice-and-music program that's coming over your radio originates in the next room.

The complete miniature broadcasting station, including batteries, is housed in a tapered plastic refrigerator box measuring 2" deep and 4" square across the front. On the lid of the box, which becomes the front panel, are mounted the crystal unit taken from an inexpensive microphone, an on-off switch, a closed-circuit phono jack, an antenna binding post, and a ceramic trimmer. The latter is used to tune to the best frequency between about 1,200 and 1,600 kc. A chassis cut from 1/16" aluminum to the size and shape shown in the drawing holds the remainder of the parts. It is bolted to the back of the same panel.

There is nothing difficult about the wiring, but this is a miniature circuit and calls for a little extra care to keep the parts from getting in their own way. Use tiny resistors—the 1/4-watt type is husky enough—and the smallest paper and mica condensers.

For the A battery, a flashlight cell intermediate in size between the regular and penlight (type C) is used. It measures just under 2" long and so can be clipped into place between the rear leg of the chassis (which acts as the negative terminal) and a separate tab of aluminum bolted to the front panel. The B-voltage supply is obtained

from two 22½-volt hearing-aid batteries wired in series. Taped together, these fit the space alongside the A cell. A 45-, 67½-, or 90-volt B battery could be used for greater economy and increased output but it will not fit inside the case. By clipping rather than soldering the B-supply leads, you can easily arrange to switch from the miniature to the larger batteries, depending upon the conditions of use.

As can be seen in the bottom-view photo at the lower left on the facing page, two terminal strips are used as meeting points for some of the connecting wires. By bolting these to the chassis as shown—opposite each other and at the same height—they can be made into a convenient shelf or ledge for the B batteries.

Since the output of a crystal pickup is considerably greater than that of a microphone, only one stage of amplification is used to broadcast records. The pickup jack by-passes the mike preamplifier (1U4 or 1T4) and is coupled directly to the grid of the oscillator-RF amplifier tube (1R5) through a .005-mfd. condenser (C2). As a precaution against overloading this tube, reduce the output of the pickup by wiring



The plastic cover (removed in this view) is held to the chassis by the protruding screw.

a 50-mmf. mica or ceramic condenser (C6) in series with the "hot" lead from the pickup.

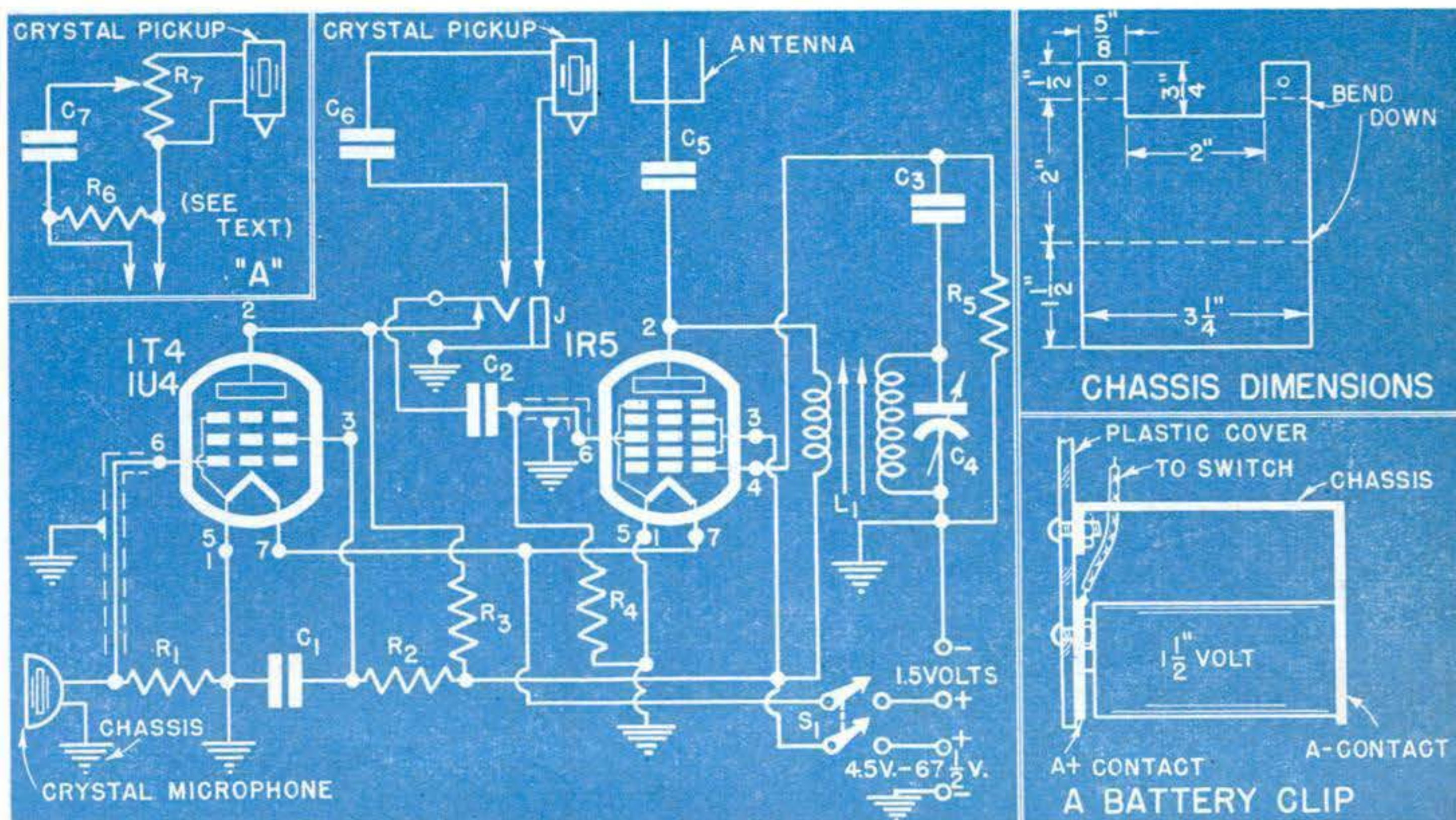
A slightly more elaborate circuit, but one that may give greater fidelity, is shown in inset "A" of the wiring diagram. With this setup volume can be controlled at the phonograph, while with the simpler one it is done at the set.—Albert Rowley, Manhattan, N. Y.

LIST OF PARTS

R1: 3.3-meg., ¼-watt carbon.
R2: 2.2-meg., ¼-watt carbon.
R3: 820,000-ohm, ¼-watt carbon.
R4: 1-meg., ¼-watt carbon.
R5: 150,000-ohm, ¼-watt carbon.
R6: 75,000-ohm, ½-watt carbon.
R7: ½-meg. volume control.
C1: .02-mfd., 200-volt paper.

C2: .005-mfd., 200-volt paper.
C3, C5: .0001-mfd. mica.
C4: 75-225 mmf. ceramic trimmer.
C6: 50-mmf. ceramic or mica.
C7: .001-mfd. ceramic or mica.
L1: 456-kc. adjustable iron-core osc. coil.

S1: DPST slide-lever switch.
J: closed-circuit phone jack.
Two 22½-volt hearing-aid batteries, one "C" size flashlight cell, tubes and sockets, crystal-mike cartridge or lapel mike, phono pickup, 25' hank ant. wire, misc. hardware.

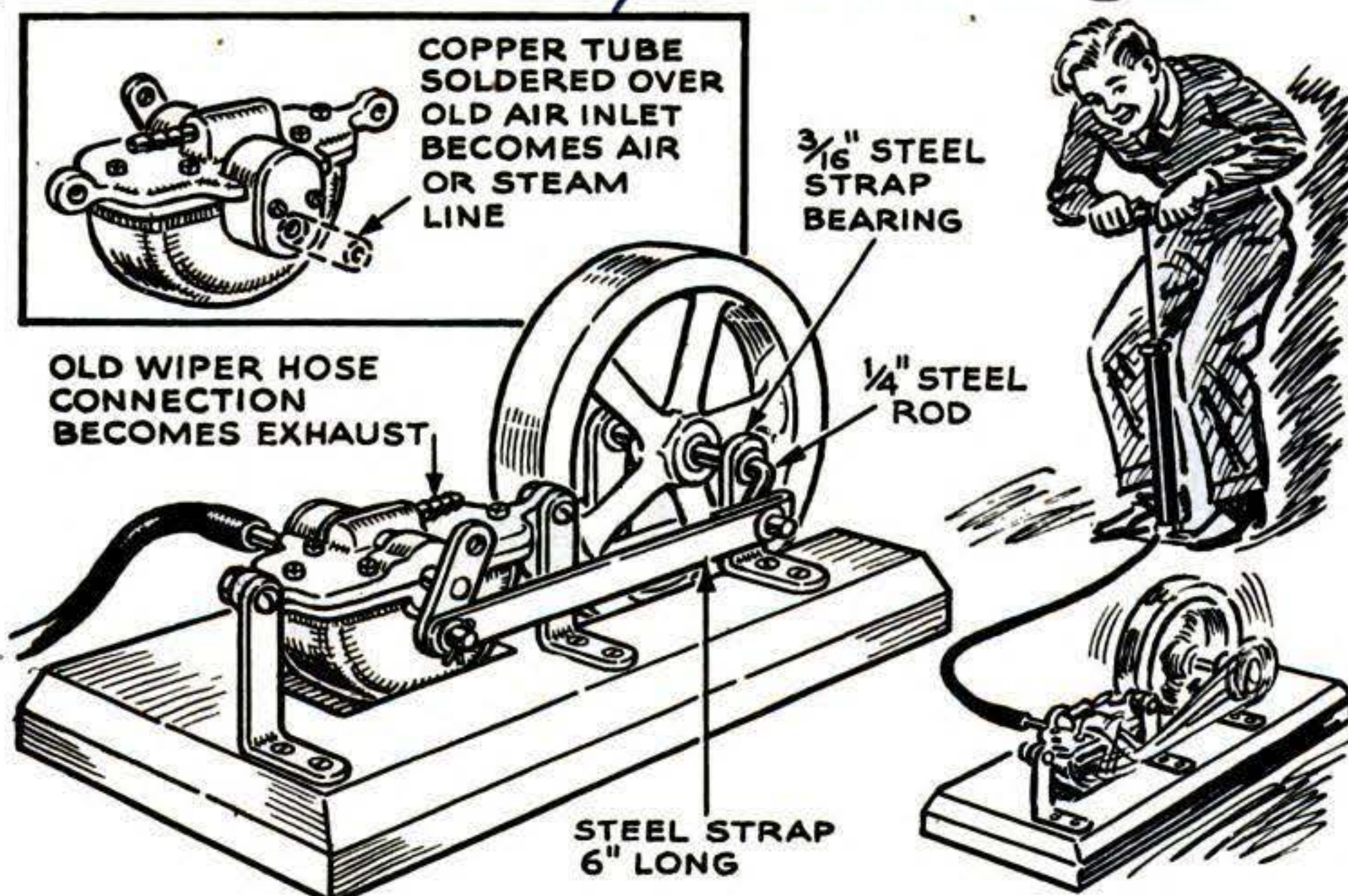


5497 Windshield Wiper Converted into Steam Engine

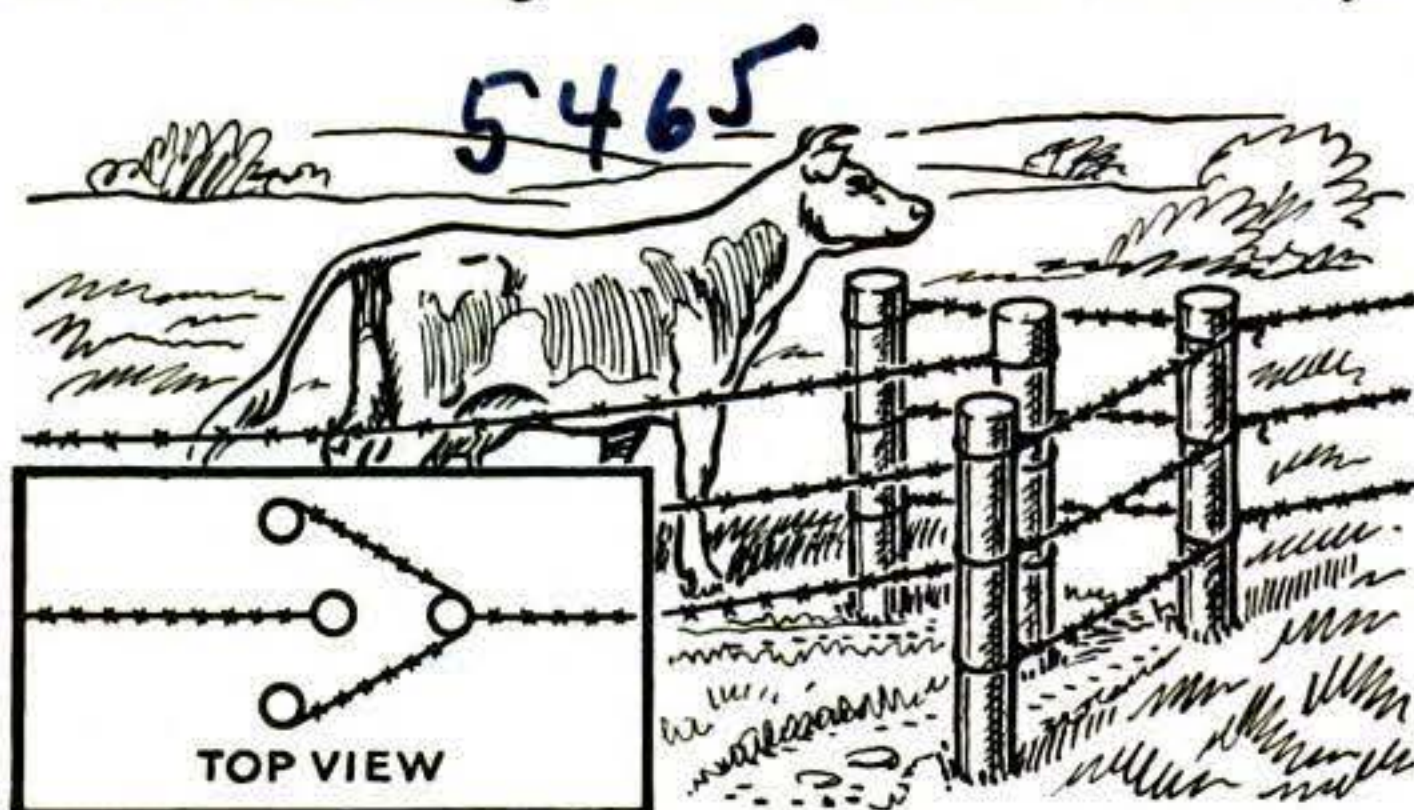
OLD windshield-wiper motors work fine as drivers for toys and models. They'll run vigorously on 3 to 8 lb. from a low-pressure steam boiler, an air compressor, or even a tire pump.

Since the motor must operate on pressure instead of vacuum, solder a small copper tube over the $\frac{1}{8}$ " air-exhaust hole in the side plate. This will convert it into the inlet pipe; the original hose connection becomes the exhaust.

A 7" clothesline pulley, weighted by a strip of lead in the groove, can be secured to the shaft by filling the hub with lead and drilling it a press fit for the shaft. One side of the oscillating crank is linked to the fly-



wheel by a 6" connecting rod. Make the wheel crank half the length of the wiper-arm stroke. Before applying steam, coat the leather-faced inner paddles with oil or grease.—R. P. Moodie, Jr., Ottawa, Can.



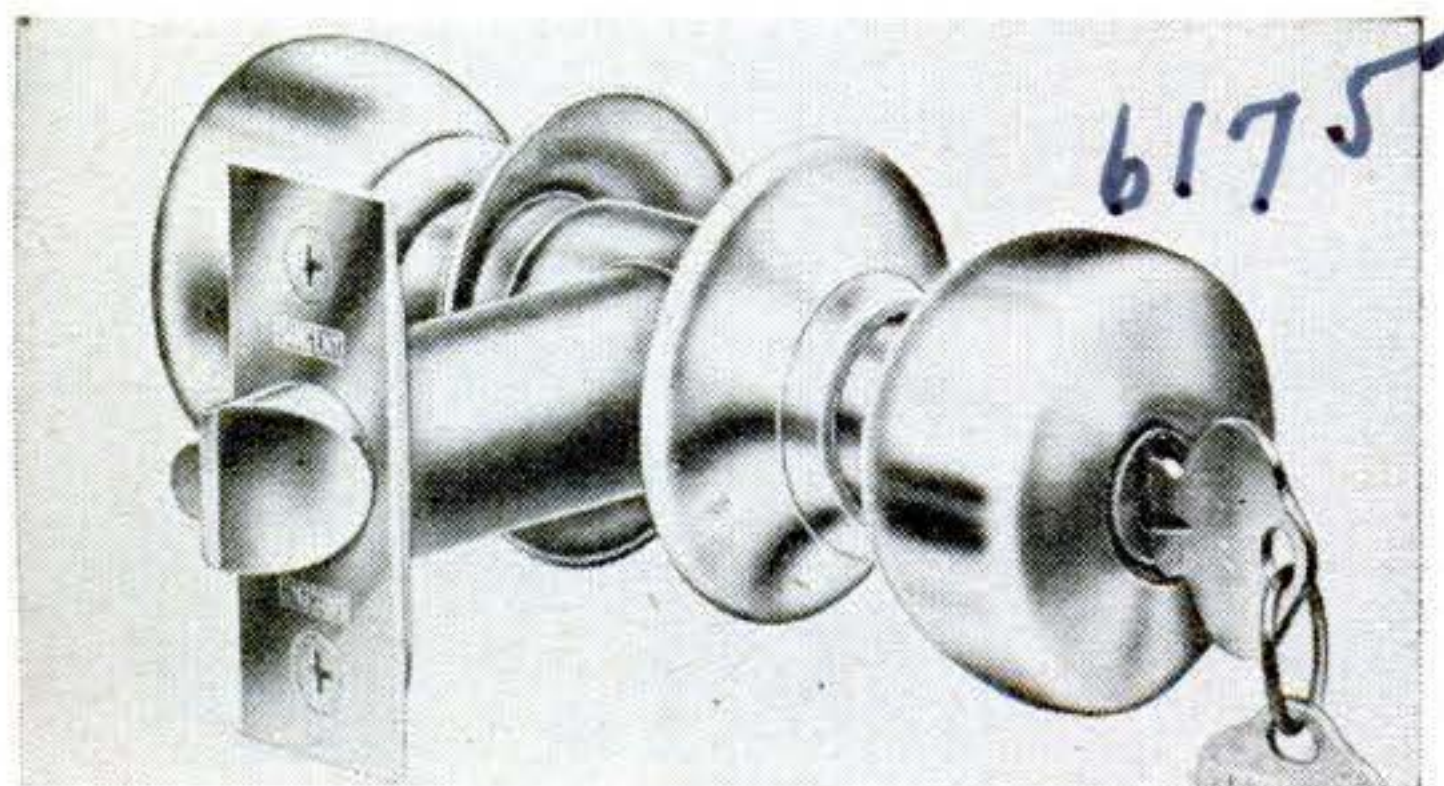
Gateless Gate Stops Animals

FARMERS will find this V-gate easier to construct than the conventional type. Several of them, spaced along the fence, will keep the barbed wire and the people who cross it from damaging each other. Two in-line posts are placed about 2' apart, and the wings of the V are separated by 3' to 4'. The resulting passage is ample for men, but too small for cattle and horses to get through.—A. H. Sabatose, Brockway, Pa.



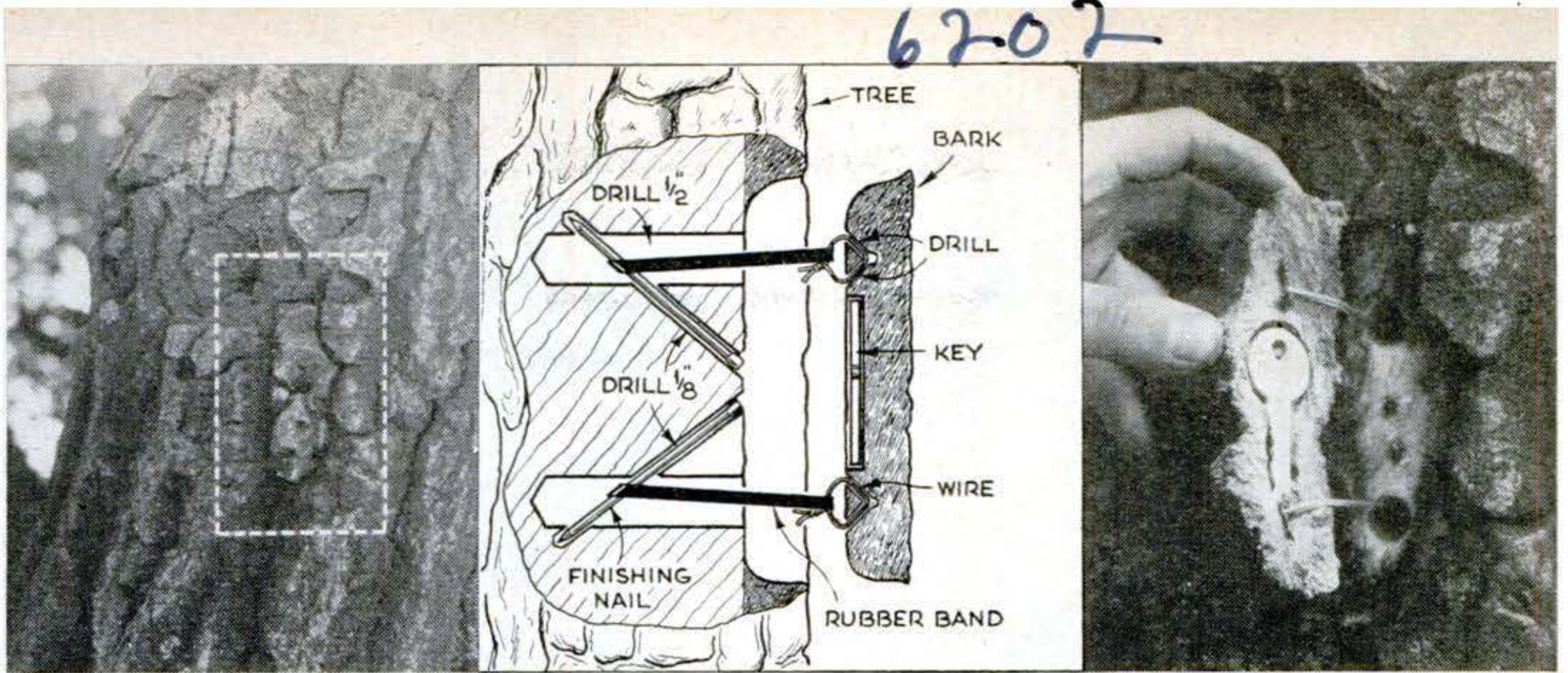
Sounding Rod Is Electrified

THE familiar sounding rod, long used by mechanics as an aid in locating the source of motor trouble, is now offered in an electrified, amplified version by Como-Tex Co., Inc., Chicago. The instrument consists of an aluminum probe, microphone, transformer, and earphones. It is powered by five flashlight cells. Sound is said to be amplified 400 times from the probe to the phones.



Lock Installed with Two Holes

A NEW series of door latches manufactured by Sargent and Company, New Haven, Conn., can be installed in wood or metal doors without mortising. The latch bolt is inserted in one hole, and the knob shaft in another. Locks are set into the knobs. Bathroom latches come with a key for opening from outside in emergencies.



Secret Cache Cut in Tree Holds House Key

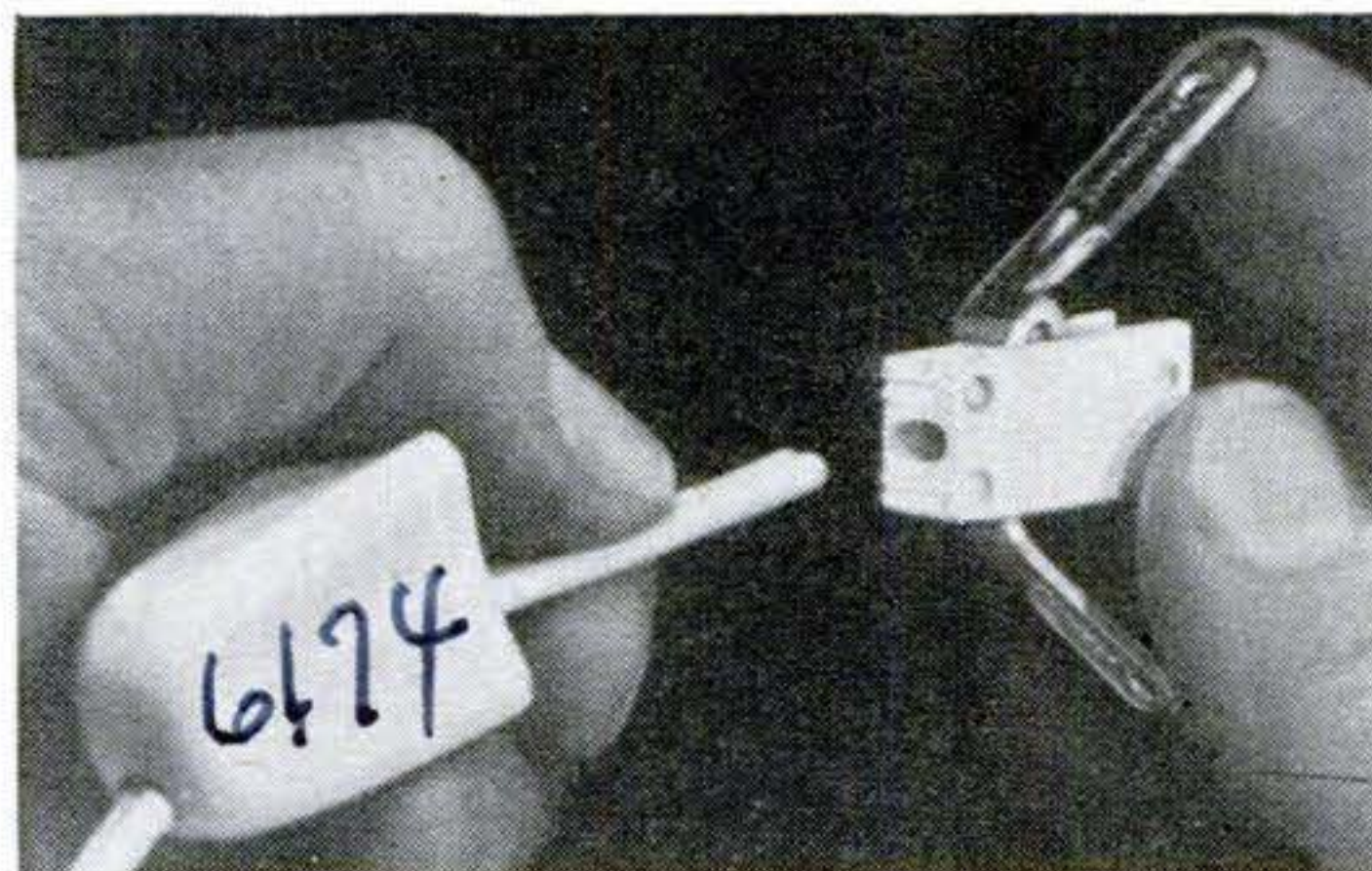
HIDING a spare front-door key for emergency use at our home is no longer a problem. A loose piece of tree bark, hollowed to fit the key, is held to the trunk as shown in the drawing and photos. The bark was removed by cutting around its natural contour with a sharp knife. After carving a niche for the key, the piece was drilled for two

small wires to anchor the rubber bands. A screwdriver was used to force the rubber bands into the two $\frac{1}{2}$ " holes in the tree, where they are held in place by finishing nails driven into the $\frac{1}{8}$ " holes. It is a simple matter to pull the bark back to get the key, and the bands snap it back in place.—Don G. Pittwood, Moscow, Id.

Test Tank Made of Large Tire

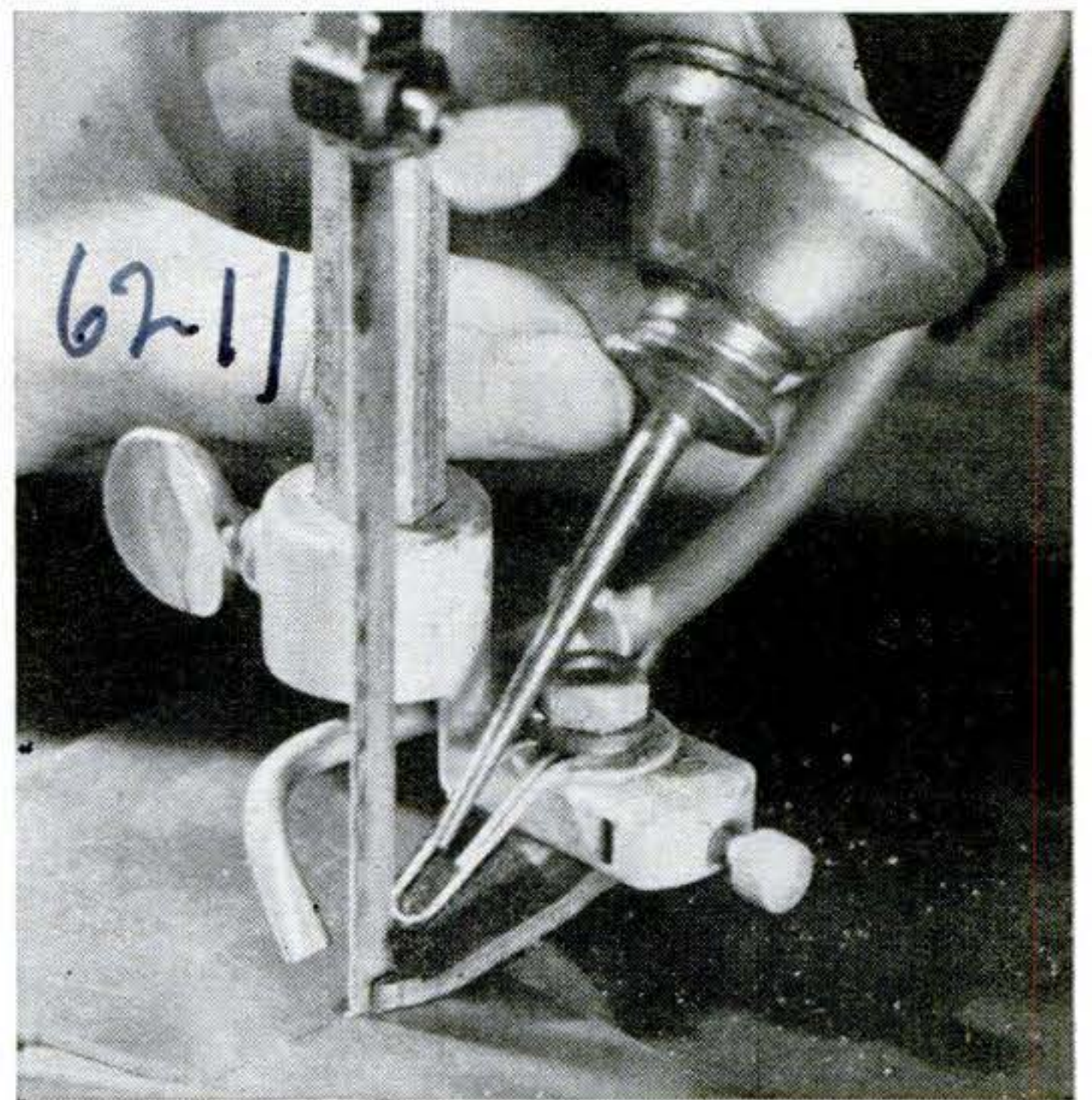


A SECTION of a large aircraft tire may be cut to form a tank to check inner tubes for leaks. The improvised tank is large enough to handle truck inner tubes.—Carl Tretin, Austin, Minn.



Plug Connects Automatically

NO TOOLS are necessary to connect this new plug made by Academy Electrical Products Corp., New York, N. Y. Metal points on the hinged prongs pierce the insulation of the wire and make contact. The inner unit then is slipped back into the cover. Both parts are made of Plaskon®.



Oil Lengthens Saw-Blade Life

WHILE jigsawing a batch of sheet aluminum, the blade frequently broke. I found that the blades lasted a lot longer if I oiled them from time to time. To keep the oil where it was needed, I used a small piece of felt that pressed against the rear of the blade and overlapped the sides a little. A bent paper clip, fastened under the guide-holding bolt, held the felt. Just a few drops of light oil on the felt from time to time did the job.—Walter E. Burton, Akron, Ohio.



Pianos aren't tough to fix if you're a careful worker. Here a grand's action is removed.

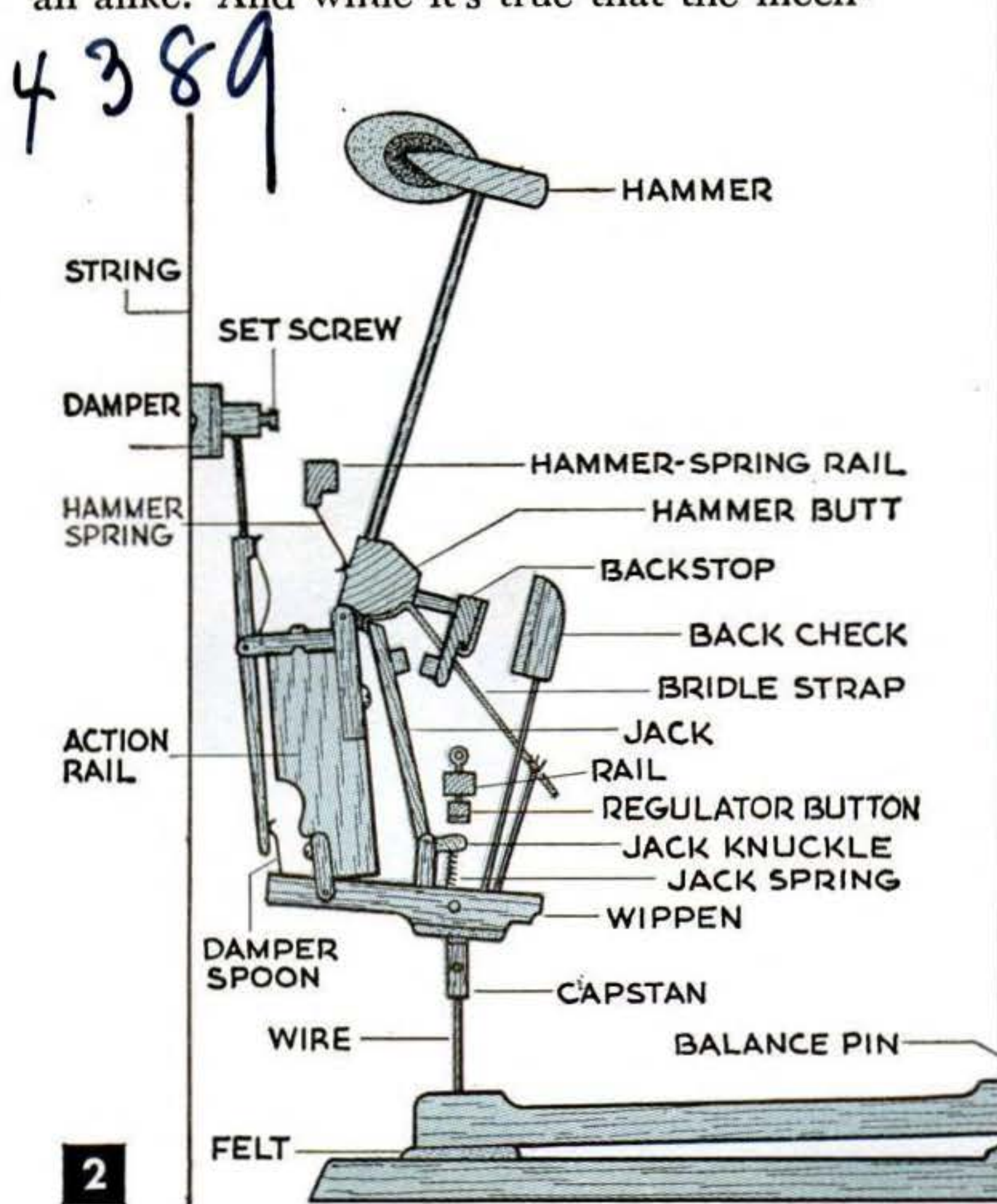
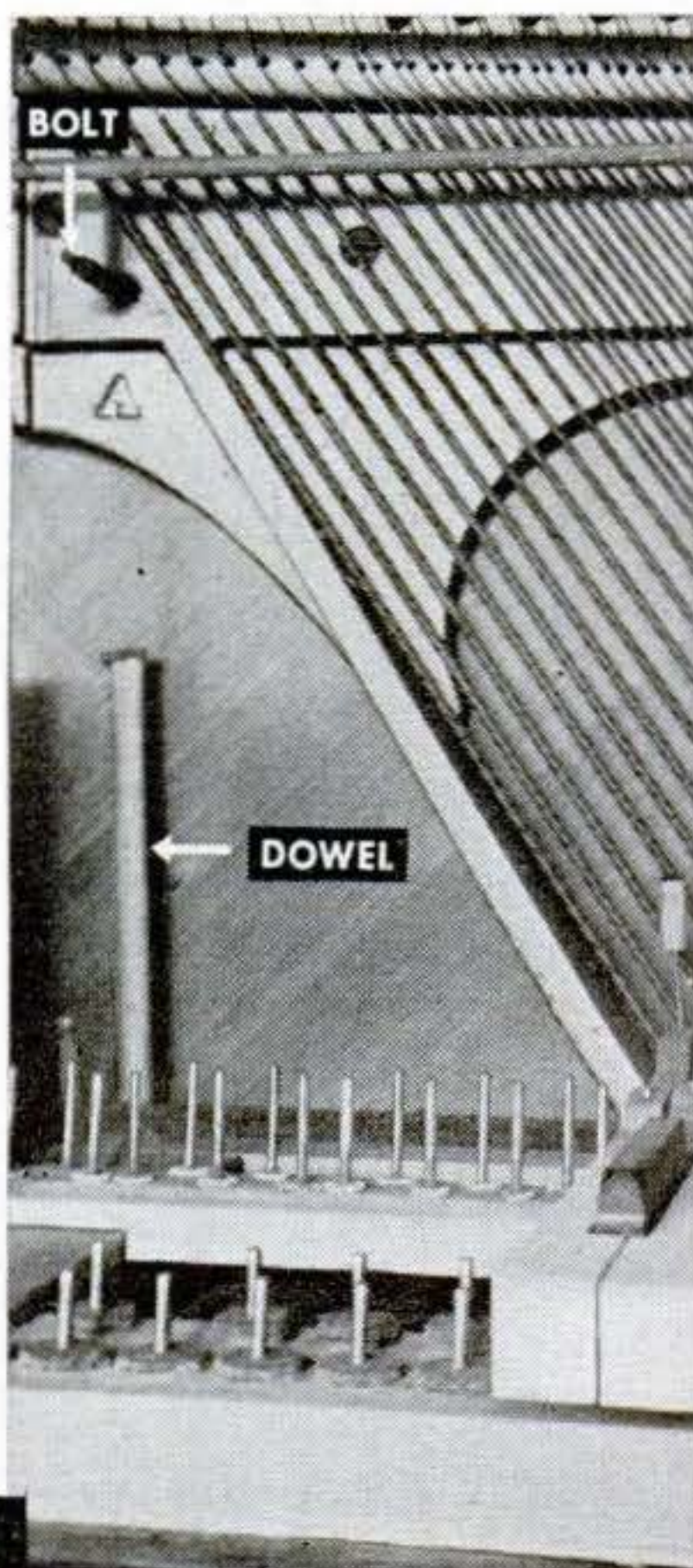
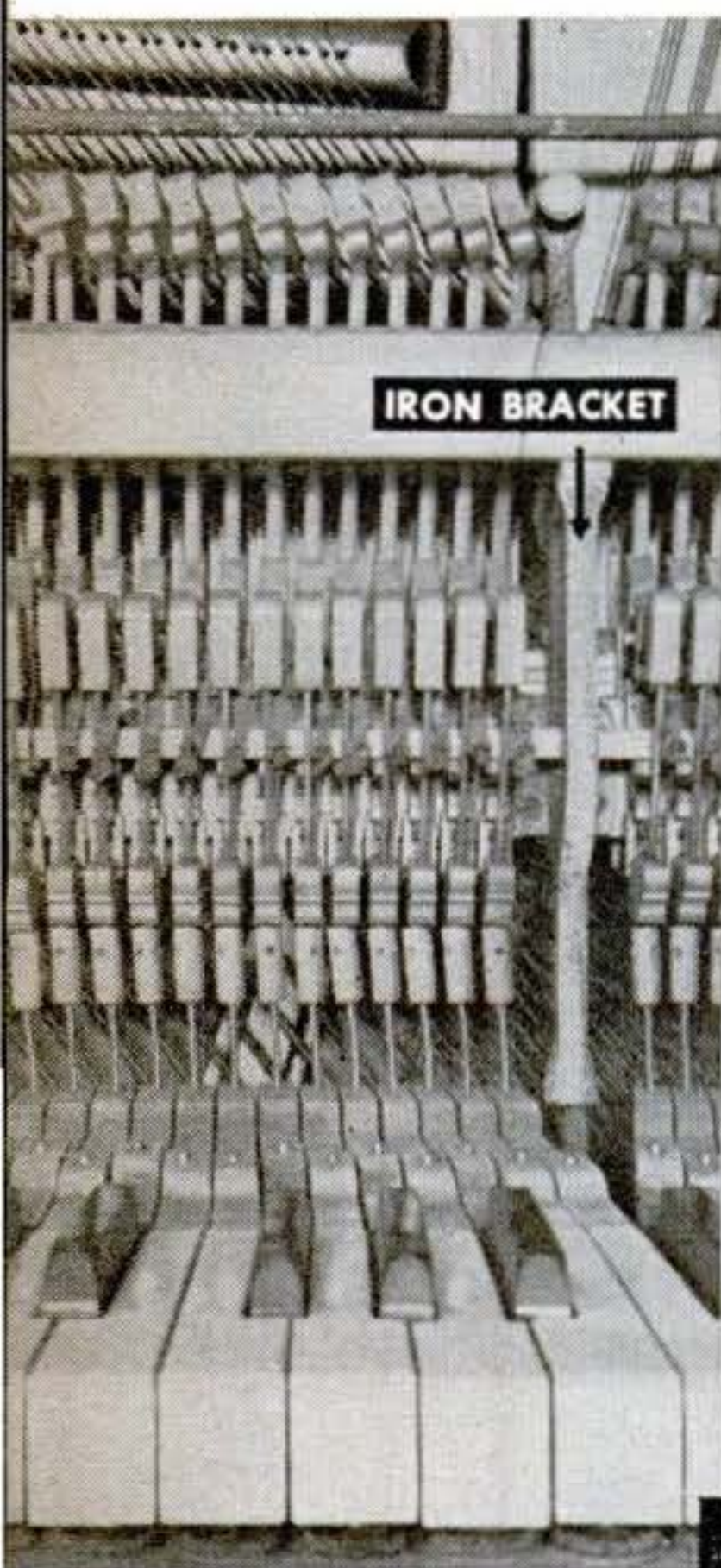
Sweetening the Sour Notes

Even if you think an octave is a fish with eight arms, you can repair your own piano.

By Al Scott

THE first time I saw the inside of a piano, I took one quick peek and slammed the lid down. It looked like an abandoned wire-manufacturing plant scrambled with a few wagon loads of scrap lumber.

Actually, it wasn't that bad at all. The strings, hammers, and straps began to make sense when I took a more careful look. After all, even though there are 88 keys, you just have to understand the action of one and you know the action of the other 87. They're all alike. And while it's true that the mech-



anism of a piano requires fine adjustment, a careful craftsman if not afraid of delicate work can make many repairs.

Getting to the mechanism of a piano is almost as easy as raising the hood of a car. In the case of the upright piano, fold back the lid and look around for the screws that hold the music-rack board. Assemblies differ, of course, but you'll probably find the board hung on a couple of screws set in the sides of the case. Lift this board out.

Then look under the keyboard for the screws holding the blocks at each end of the keyboard and for the screws that keep the front rail in place. (That's the rail just in front of and a little below the keyboard.) Back out those screws and then you can lift out the front rail, the blocks, and the fall board that covers the keys.

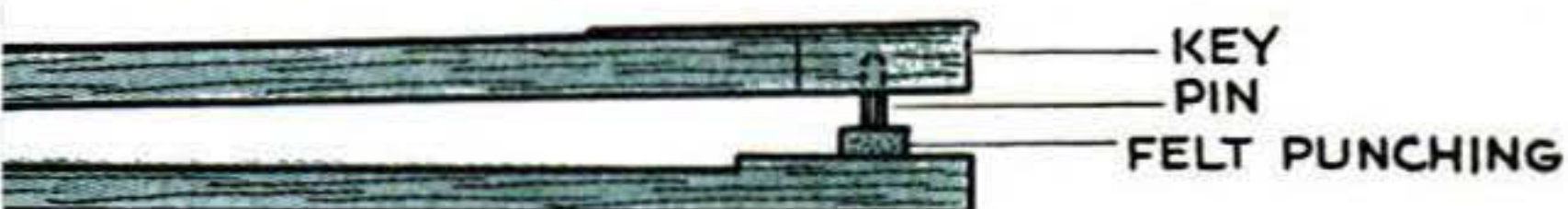
By now your piano should look like the left side of Fig. 1. The other part of Fig. 1 shows a section of an upright piano after the action and some of the keys have been removed. The iron bracket is cone-shaped at the bottom, where it rests on a ball pointed bolt. The top of the bracket is forked and is held to a bolt by a nut. Usually there are four such brackets. Remove the nuts, pull the action toward you, and raise it up and out. If the dowels running up from the pedals are screwed to the action, first remove those screws, of course.

The keys are held in position by the pins shown in Fig. 1. Should a key rub an adjoining one, tap the pin over until you get proper clearance. Lift all the keys out, and use sandpaper to remove any rust from the pins. Renew any felt punchings on the pins if necessary, and clean under the keys with a vacuum-cleaner attachment.

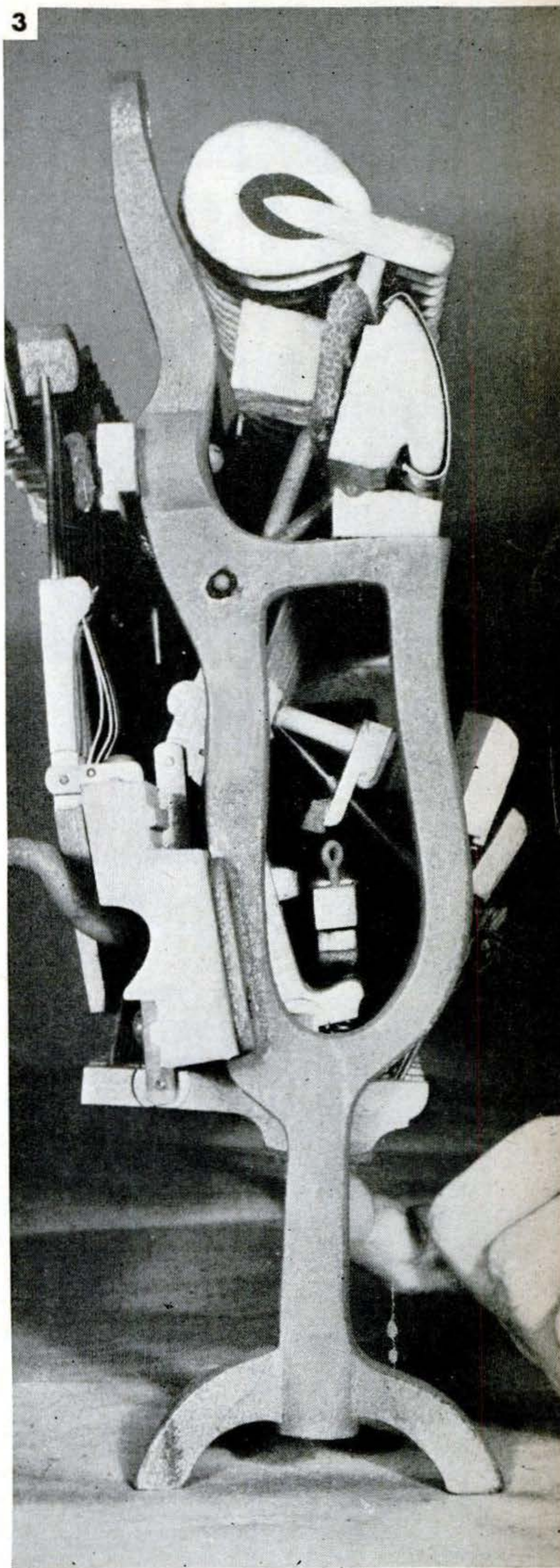
Figure 2 shows you the action of a single key of an upright piano. Figure 3 is the bass end and footed bracket of an upright's action. For clarity, the supporting iron framework is not shown in the drawing. Here's what happens when you push down a key:

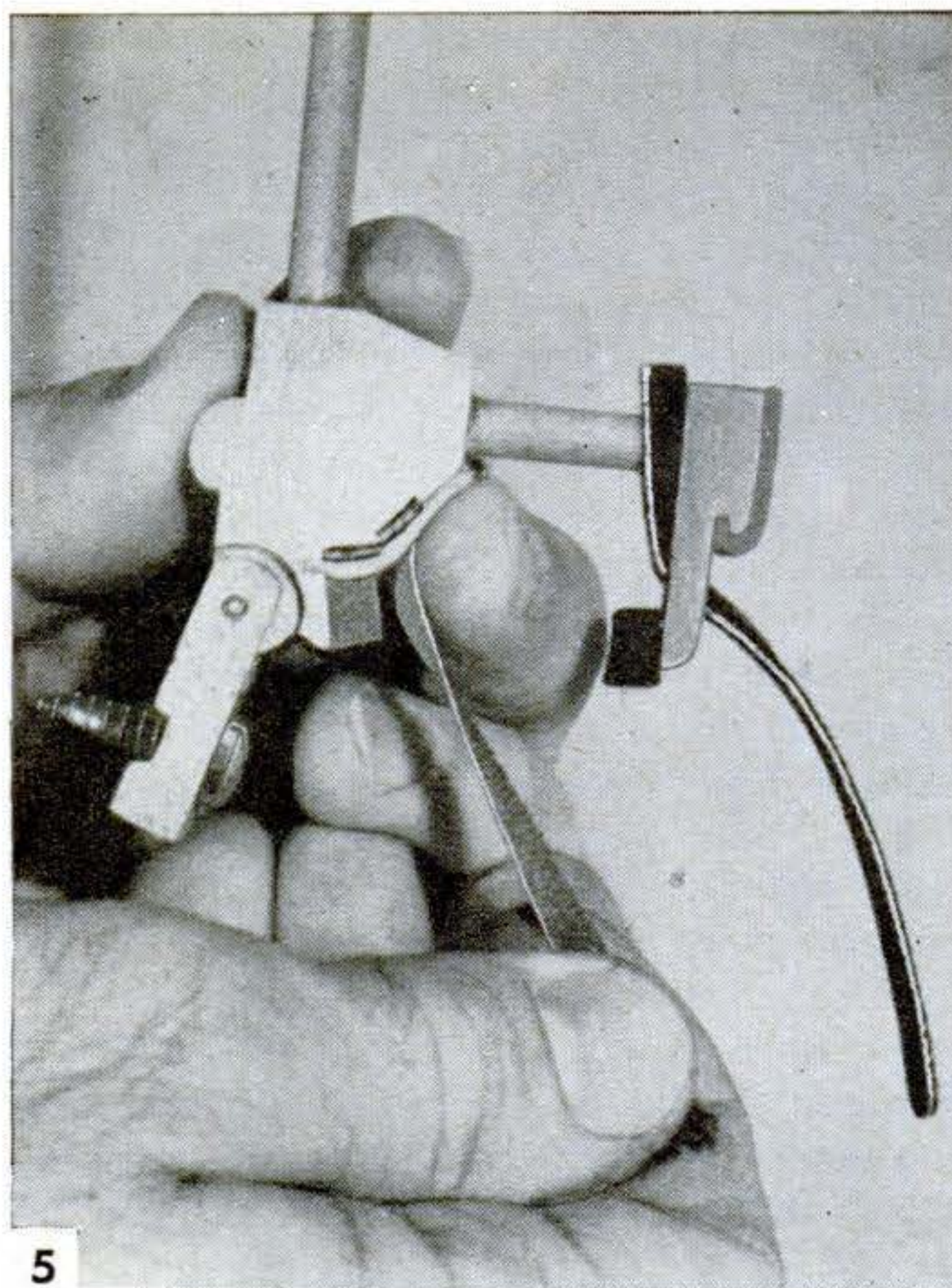
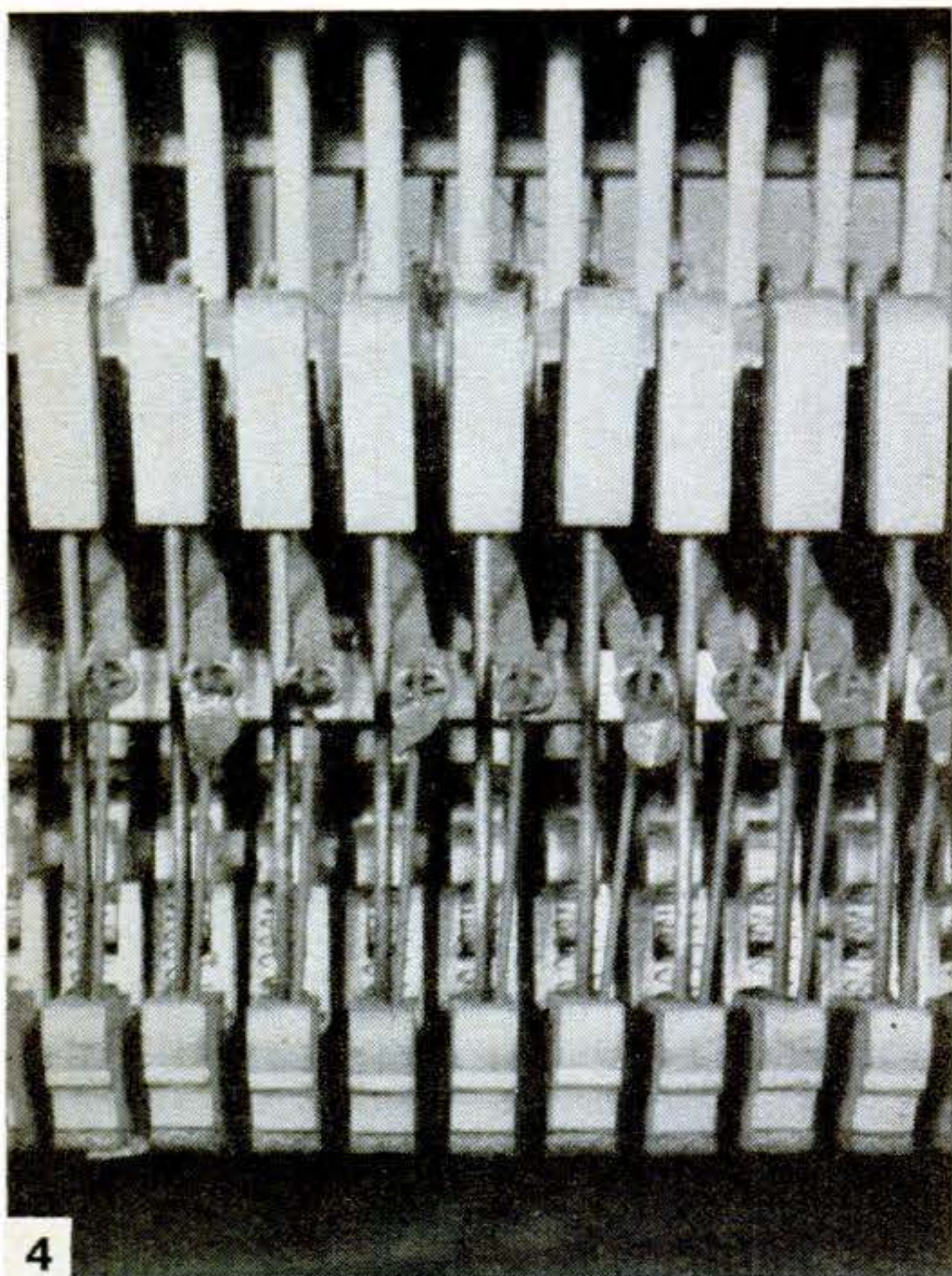
The key seesaws on the balance pin, raising the capstan. In this case, the capstan is a short piece of dowel threaded on a heavy wire. There should be no play between the capstan and the wippen. Insert a nail in the hole in the dowel to turn it until it is snugly against the wippen.

The capstan moves the wippen upward,



3



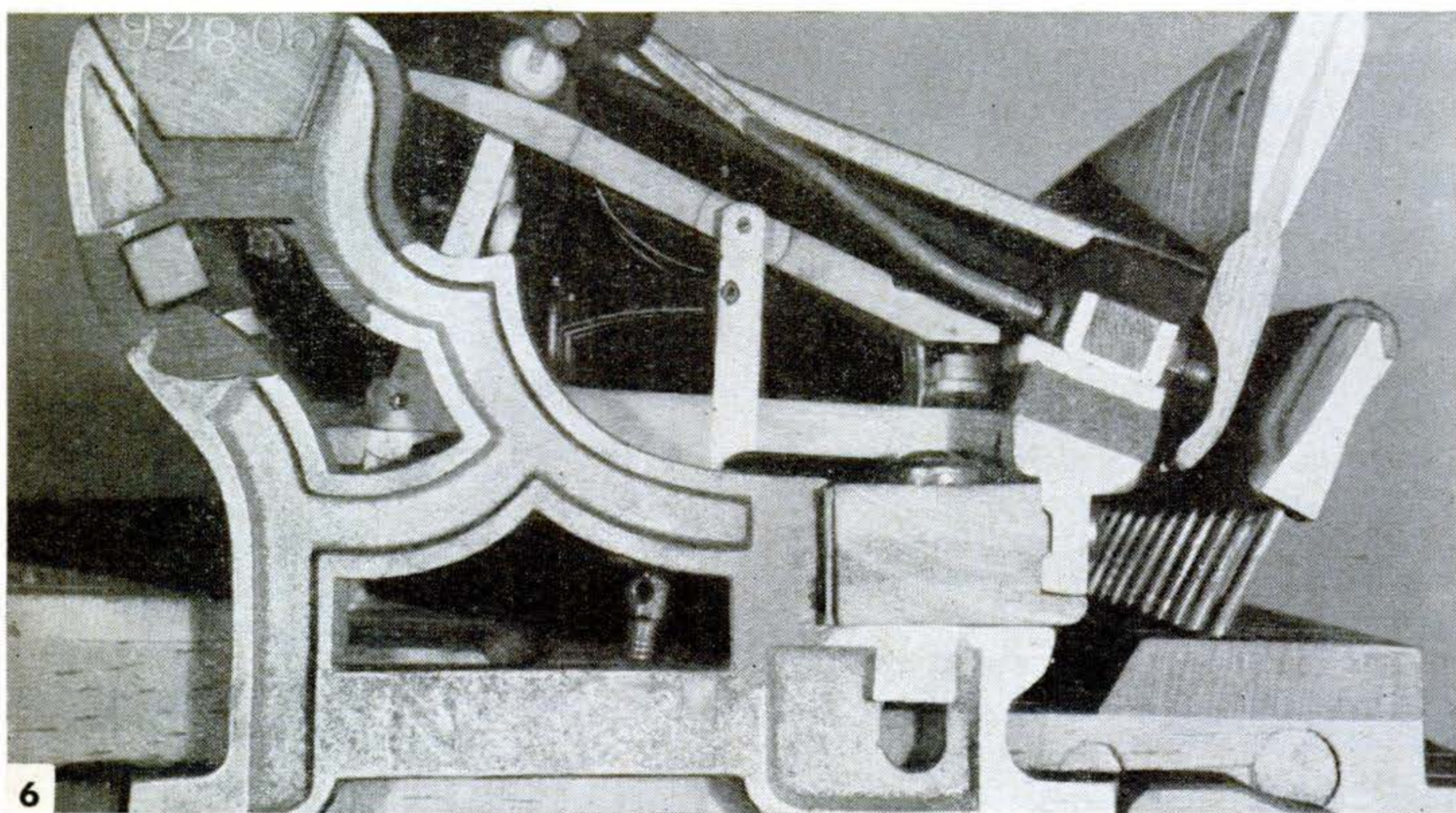


raising the jack and lifting the hammer. The jack continues to lift the hammer butt until the jack knuckle hits the regulator button, which trips the jack out of a notch in the hammer butt. The regulator button's screw eye is used to adjust the button. Set it to trip the jack when the hammer is $\frac{1}{2}$ " from the strings in the bass section and $\frac{1}{8}$ " away in the treble section.

On the left end of the wippen is the damp-

er spoon. Bend it so the damper lifts from the strings when the key is one-third depressed. The back check should move forward to catch the backstop when the hammer has returned about one third of the way from the string. Bend the wire on which the check is mounted until it catches the stop at that point. Some of the heavy back-check wires are shown in Fig. 4, a front view.

The ends of the shorter wires in Fig. 4 are



bent like buckles to hold bridle straps. This strap hastens the return of a hammer for repetition. You may find some of these straps worn or broken. They can be replaced with a slitted-type strap that slips over the backstop as shown in Fig. 5.

Dampers and hammers are attached to the action rail by screws. In the case of the hammer, the screw will seem to be inaccessible, being hidden behind the top of the jack. However, the jack is flexible enough to be pushed aside with a screwdriver. If a hammer stem is broken, replace it or glue it together and wrap it with silk thread.

If the felt on a hammer head has hardened, remove the hammer from the action and soften the felt with a needle. Use a No. 5 needle. Jab it several times into the felt on the top and bottom of the head. Don't stick the interior felt and don't shove the needle into the part of the felt that strikes the string. If the felt is deeply grooved from striking the string, reshape it with fine sandpaper.

Now let's compare the action of an upright and of a grand. The action of an upright lifts out, leaving the keys in place on their pins. The action and keys of a grand slide out of the piano in one complete unit. On a grand you'll also find the front rail and end block held by screws underneath. Grasp the keyboard at each end and slide it out by pulling it toward you.

You have to be careful here. If a hammer is up or is raised while you are removing the unit, you may snap a hammer stem.

Figure 6 is the treble end of a grand's action, while Fig. 7 shows you the various parts. The action is very similar to that of an upright. When a key is depressed, the capstan raises the wippen. The jack passes through a slot in the repetition lever, pushing against the roller and raising the hammer until the jack is tripped off the roller by the knuckle hitting the regulating button.

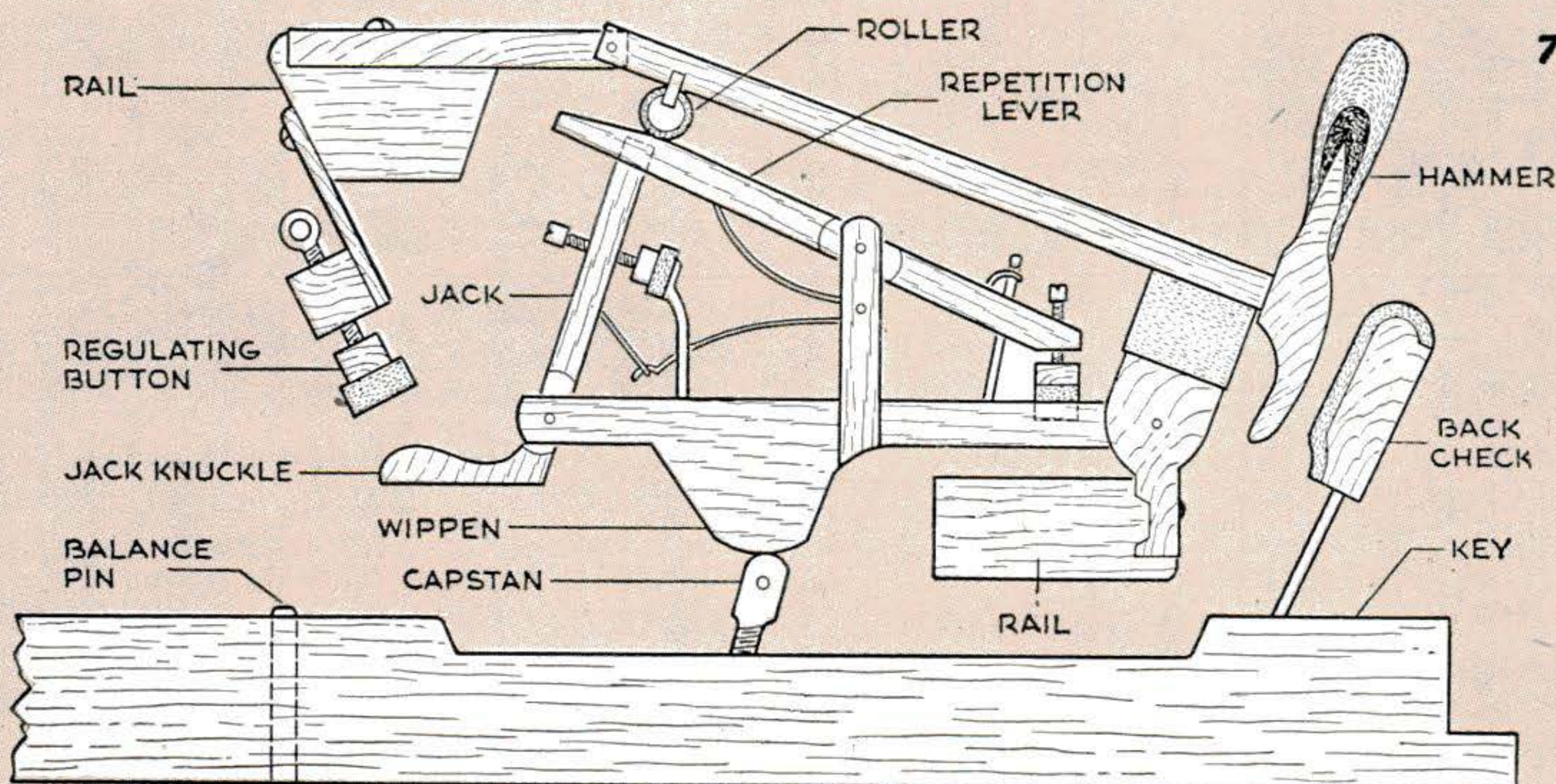
Turn the screw eye of the regulating button so the button trips the jack when the hammer is about $5/32$ " from the string.

In general, the mechanisms of all pianos require many pieces of felt of various sizes and thicknesses as well as numerous springs. When going over your piano, keep a sharp lookout for wrinkled felts and loose or broken springs. Replace or tighten these parts where necessary.

Keys that have yellowed may be reconditioned by first scraping them carefully with a razor blade, and then polishing them with whiting on a dampened piece of felt. The whiting, springs, felt, and a special glue for loose ivories or black keys may be bought at piano supply houses.

Here are some approximate prices on replacement parts: Bridle straps, \$1.25 per hundred; hammer head, 15 cents; hammer stems, 25 cents a dozen; hammer butt, 20 cents; wippen assembly, 25 cents; capstan, 15 cents; complete set of punchings for under keys, \$5; and miscellaneous felts, such as butt felts, 20 cents a hundred.

For comparison, tuning and replacement of bridle straps alone costs about \$15. **END**



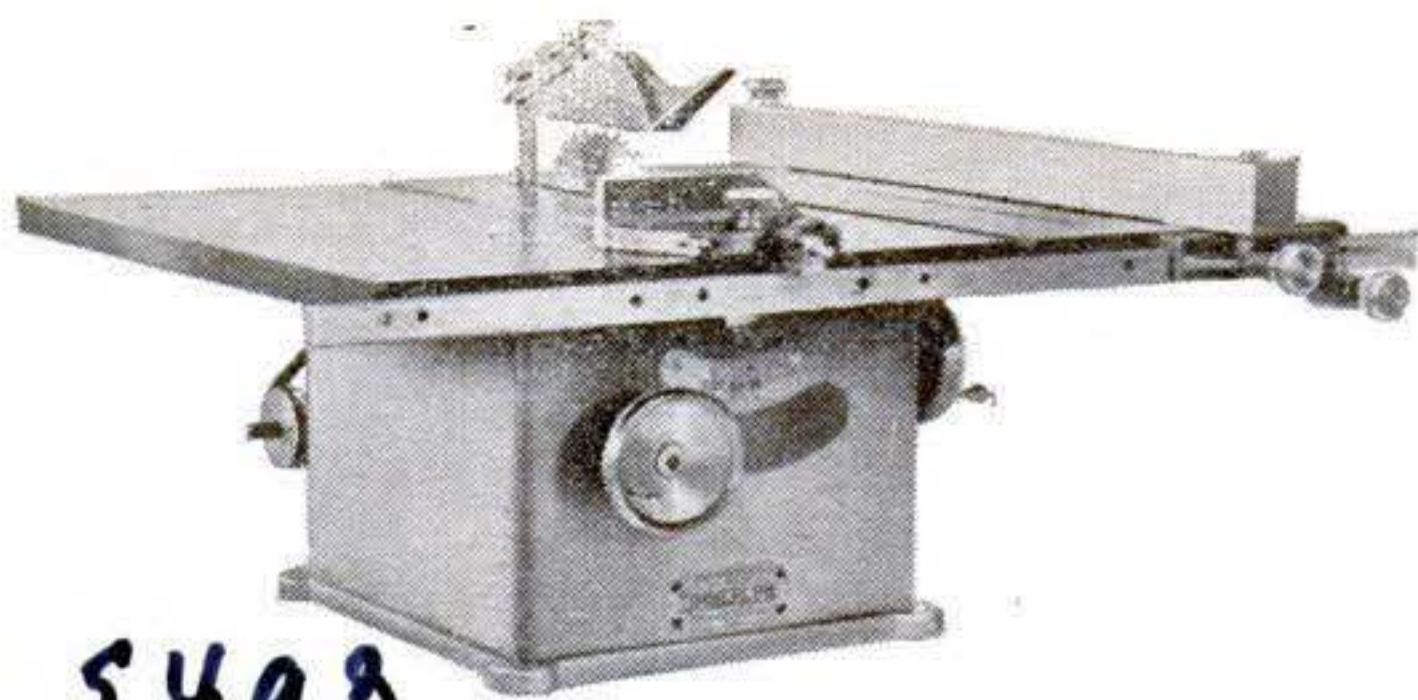


Wrench Reaches Tight Spots.

Here's a new open-end ratchet wrench designed especially for use on pipe, tubing, conduit, cable, and rod fittings in restricted areas. The ratchet heads operate in an arc of $7\frac{1}{2}$ deg. or less. Heads, sockets, and accessories may be bought separately or in sets. An adapter also makes it possible to use standard sockets with the head. Sets sell for about \$15. C. J. Hendry Co., San Francisco, is the maker.



Midget Tools Aid Hobbyists. A set of midget woodworking tools for the use of hobbyists is offered by Toddward Products, Buffalo, N. Y. Made of cast aluminum, the tools have steel cutting edges. The plane is $1\frac{1}{8}$ " wide, $3\frac{1}{8}$ " long, and has a $\frac{7}{8}$ " blade. The spokeshave has a $\frac{13}{16}$ " blade, as does the end shaver or scraper. The tools are sold as a kit for about \$2.

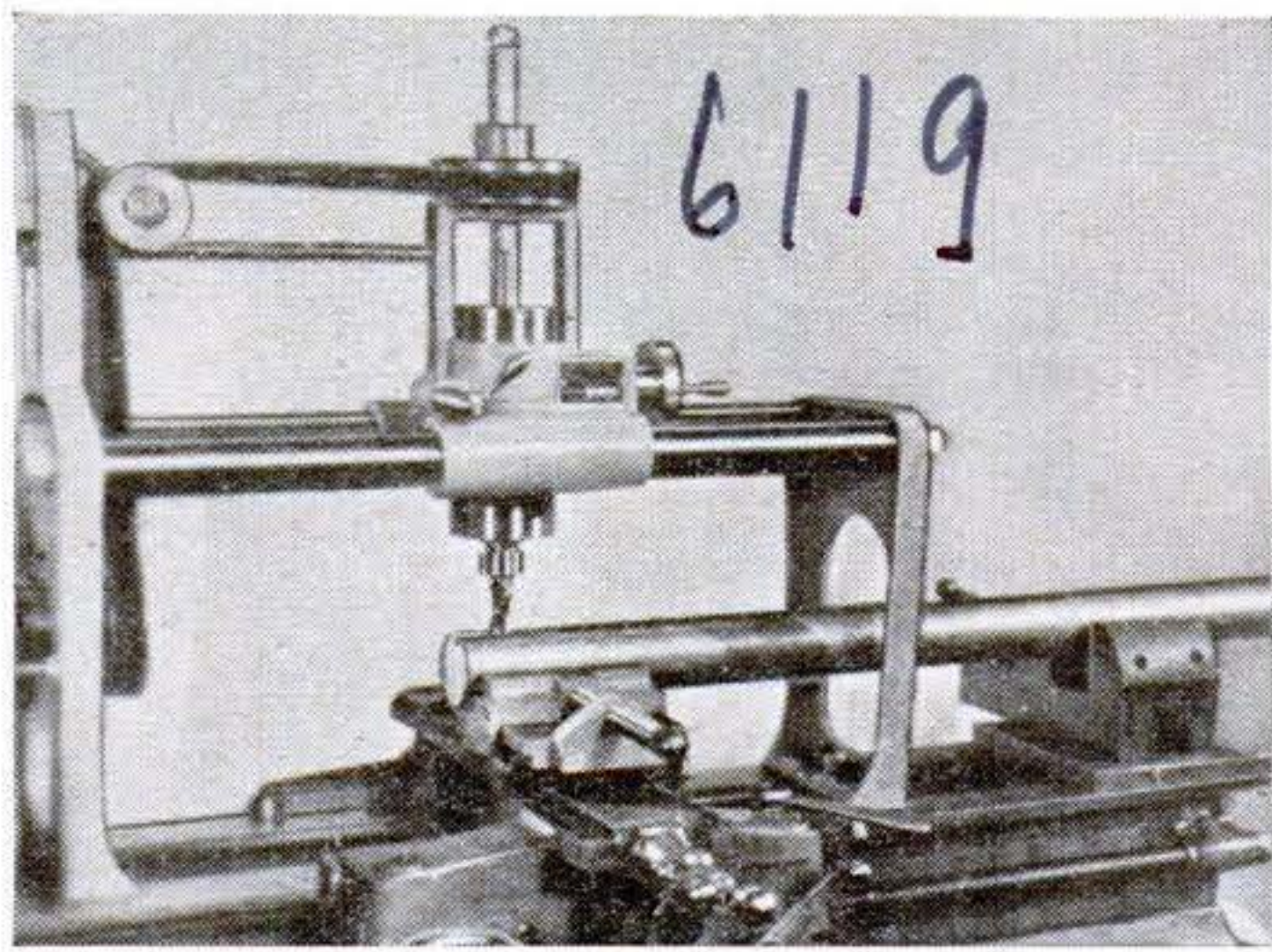


Saw Has Big Table. With accessory extensions, this tilting-arbor table saw offers a 24" by 42" work area, 12" in front of the 8" blade, and 25" between the blade and fence. The motor tilts with the arbor, the table has a measuring scale, and a pinion knob provides fine fence adjustment. West-built Metal Products Co., of Los Angeles, makes it for about \$90, extensions extra.

Magnifier. A light hammer with a built-in seven-power lens is made by the L. S. Starrett Co., Athol, Mass. Intended primarily for tool and die makers, it makes possible accurate spotting



and punching of centers and intersections. Weighing only 4 oz., the hammer is made with flat and ball-peen heads, which are offset to permit close work. Price \$2.75.



Vertical Miller Fits on Lathe.

A milling attachment that clamps on the ways of a bench lathe is offered by Palmer Industries, Inc., Chicago. To hold the work, the compound rest is replaced with a vise that's furnished with the mill. The unit will make an 8" cut on the longitudinal feed and half that distance on the cross feed. It handles stock up to 3" dia. Price about \$100.

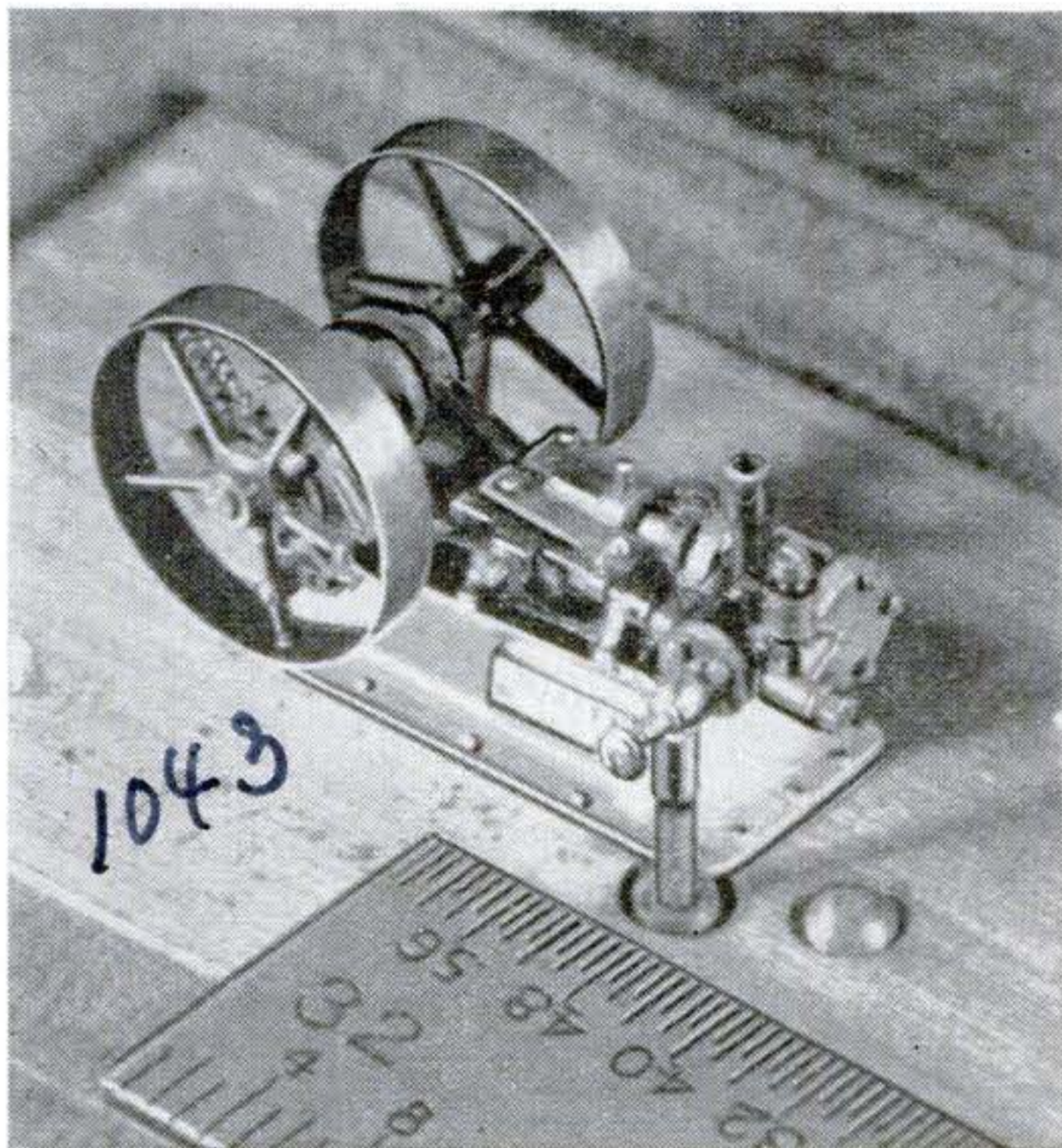
Craftsmen

Show Their Work



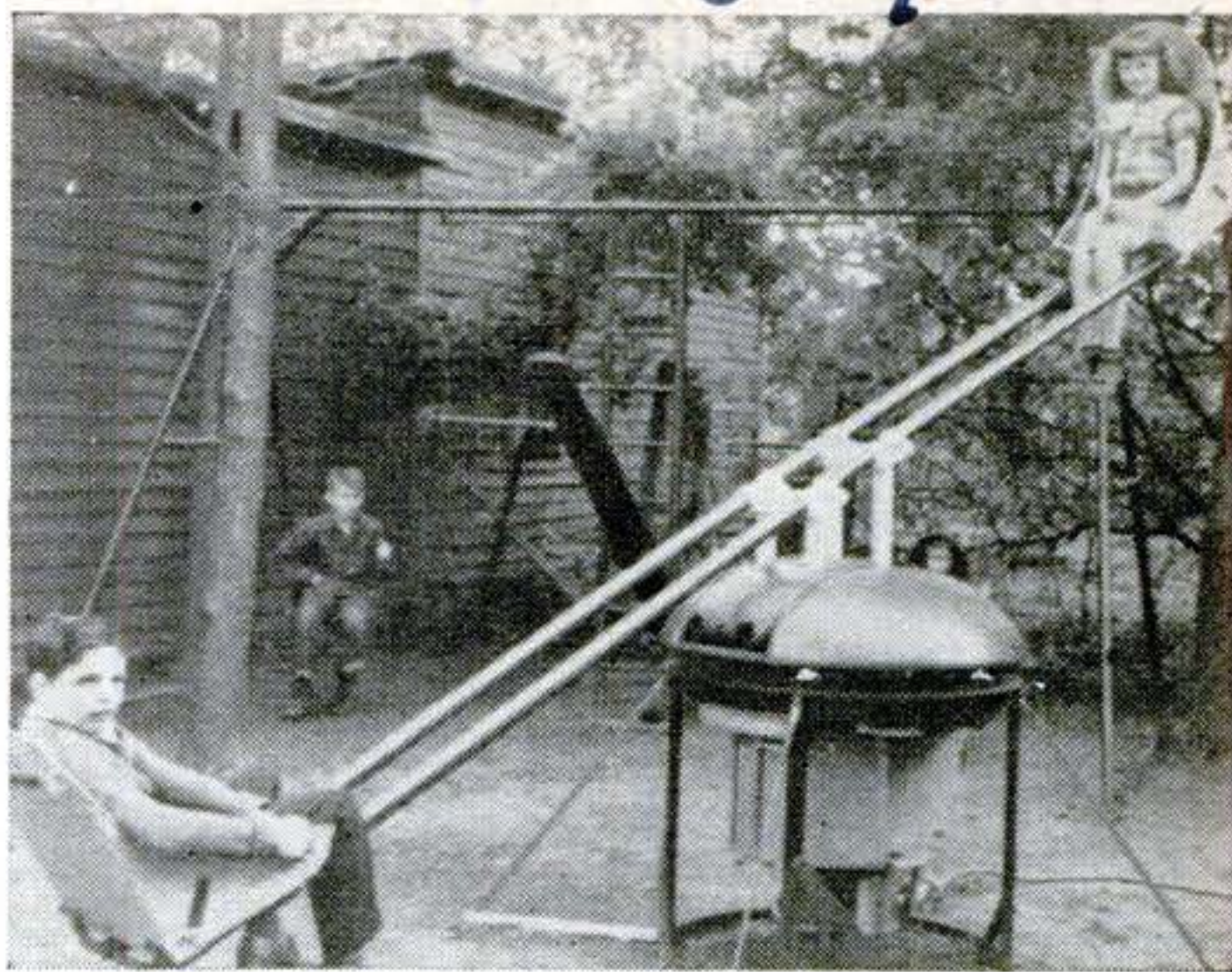
Kitchen Lamp.

Mrs. William J. Ort-gier of Bell, Calif., wanted a lamp for her cooking quarters. Her husband filled the or-der—with a ven-geance. This culinary masterpiece is made of a plant-filled des-ert mold, a round snack board, a coffee maker, and a colan-der. There's a bulb and socket and some wire in there, too.



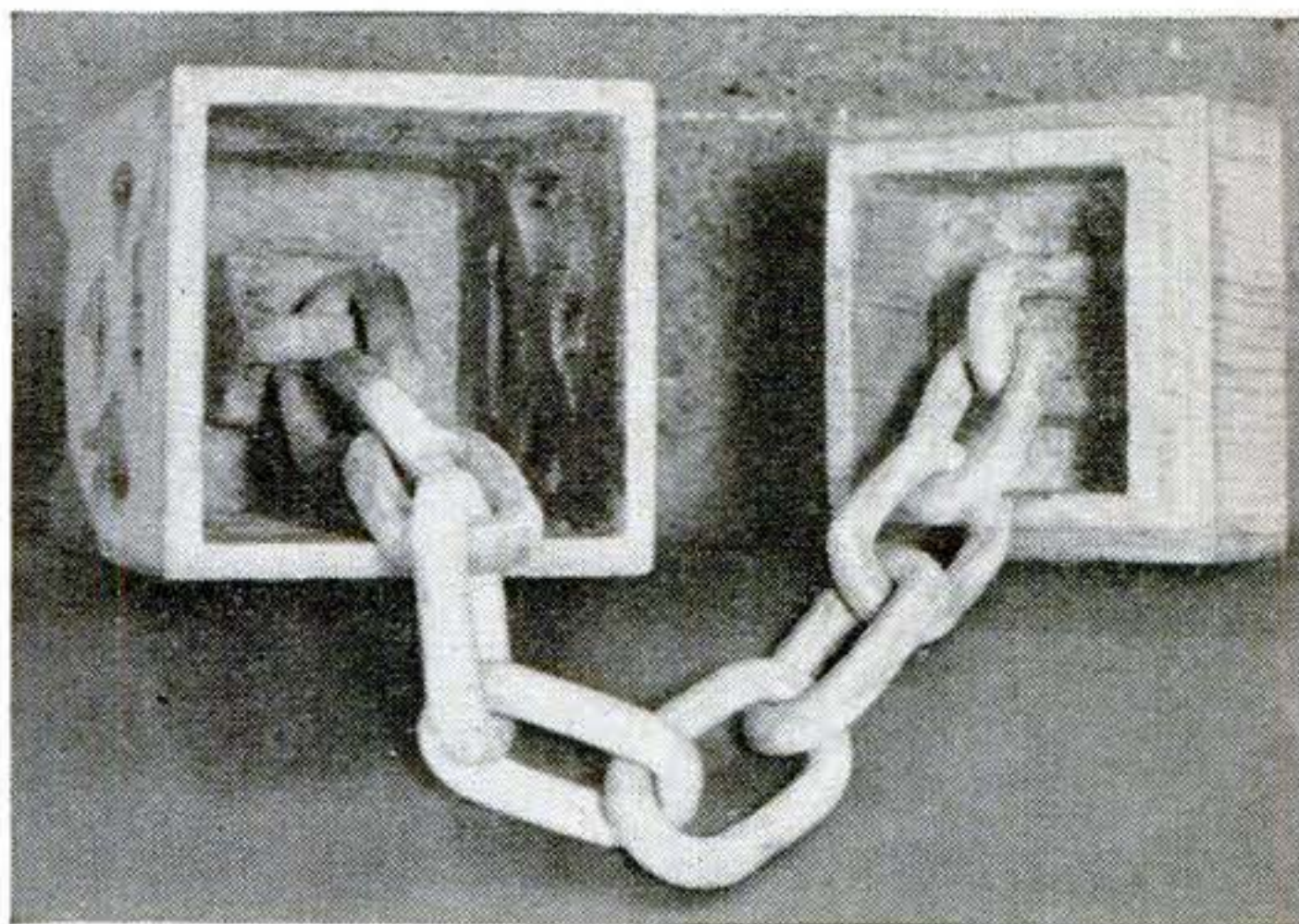
Tiny 1892 Engine Still Runs.

Certainly one of the smallest working mod-els ever built is this 56-year-old testimony to the craftsmanship of C. H. Allen, Sr., of Pittsburgh. It measures a mere $\frac{3}{4}$ " in length and is $\frac{7}{16}$ " wide. Stud bolts are .008" dia. and have 750 threads per inch. The en-gine boasts a double disk crank, a flywheel governor, a cylinder lubricator, and a throt-tle valve. Piston and valve rods run through packing glands. Output of the midget steam engine is estimated at .0002 hp.

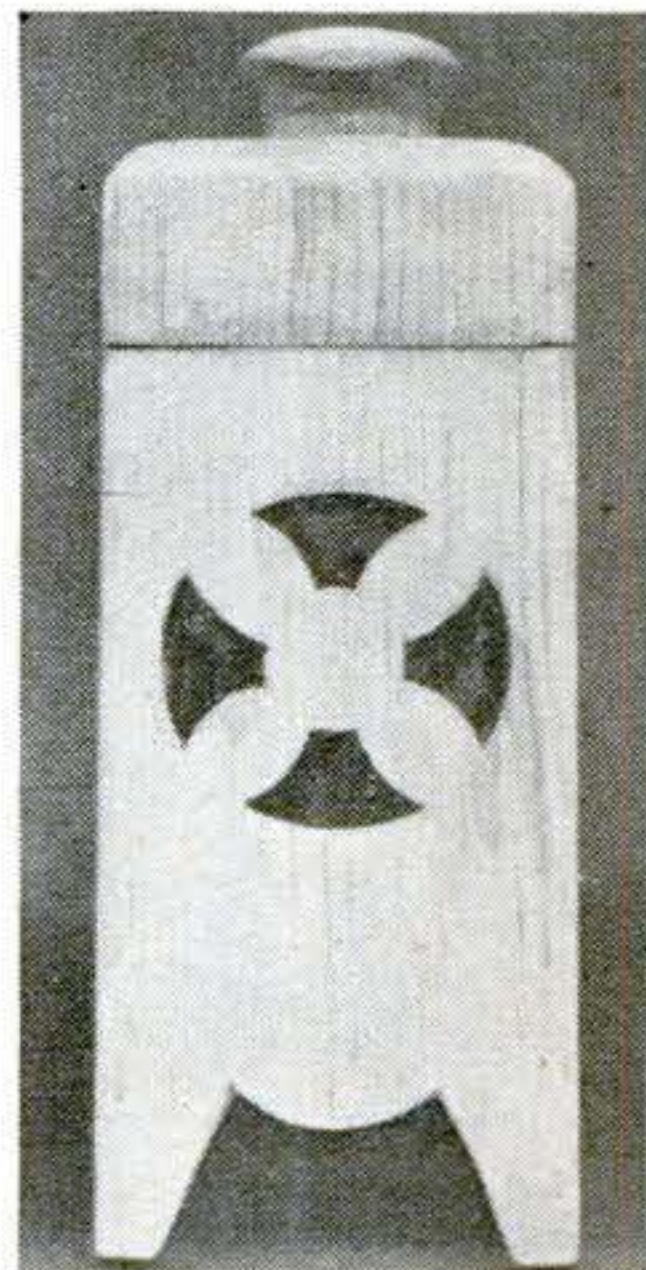


Seesaw Goes Round and Round.

A two-seater merry-go-round and self-act-ing seesaw was built almost entirely from surplus and scrap parts by E. C. Mitchell, of Atlanta, Ga. Two $\frac{1}{2}$ -hp. DC motors, shunt-connected, are powered through a step-down transformer and copper oxide rectifier. Both of the latter are home made. The center housing is a machine gun turret from a B-29. It turns at about 8 r.p.m. A pair of aluminum bucket seats are spaced about 12' apart.



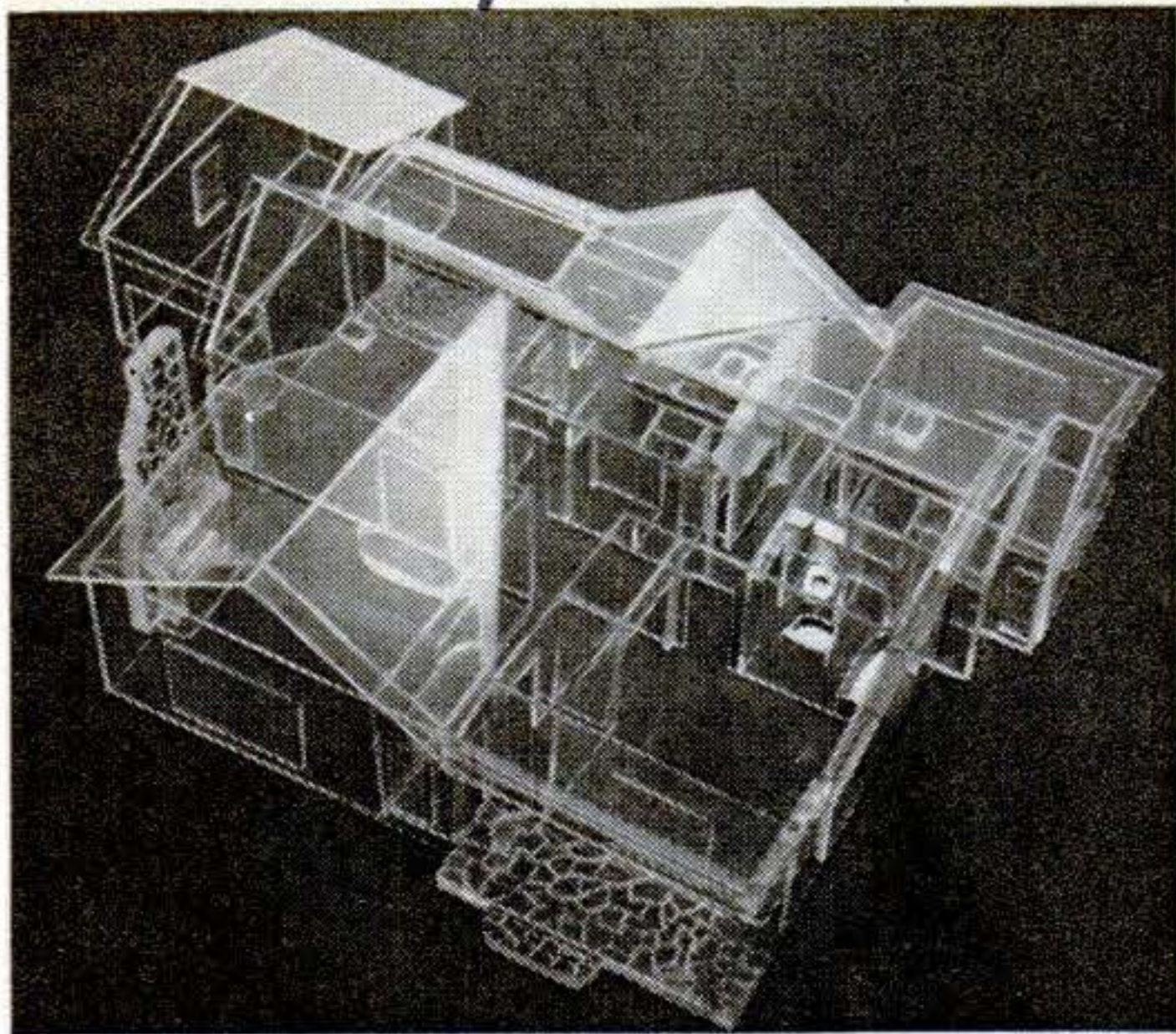
One Piece. A solid block of wood that measured $3\frac{3}{4}$ " by $3\frac{3}{4}$ " by 20" at the start was whittled inside and out to produce this chain and box. The chain is connected to both the lid and box bottom. Finished size of the box is $3\frac{3}{4}$ " by $3\frac{3}{4}$ " by 10". This in-tricate project is the work of Ben F. Ross, a master whittler, of Schenectady, N. Y.



3290

NOVEMBER 1948 233

written by James P. Trent, 426 E. Gray St.,
Norman, Okla.



A blueprint in plastics. With a transparent model you can avoid cost of putting in last-minute extras or leaving something out.



Putting a roof in place. Plastic solvent bonds all pieces. Roofing is the most time-consuming part of the job, the modelmaker says.

52 88

Three-Dimensional Blueprints in Plastic

IF MR. BLANDINGS could have peeked through transparent walls into a scale model of his dream house, he might have had fewer nightmares during its building.

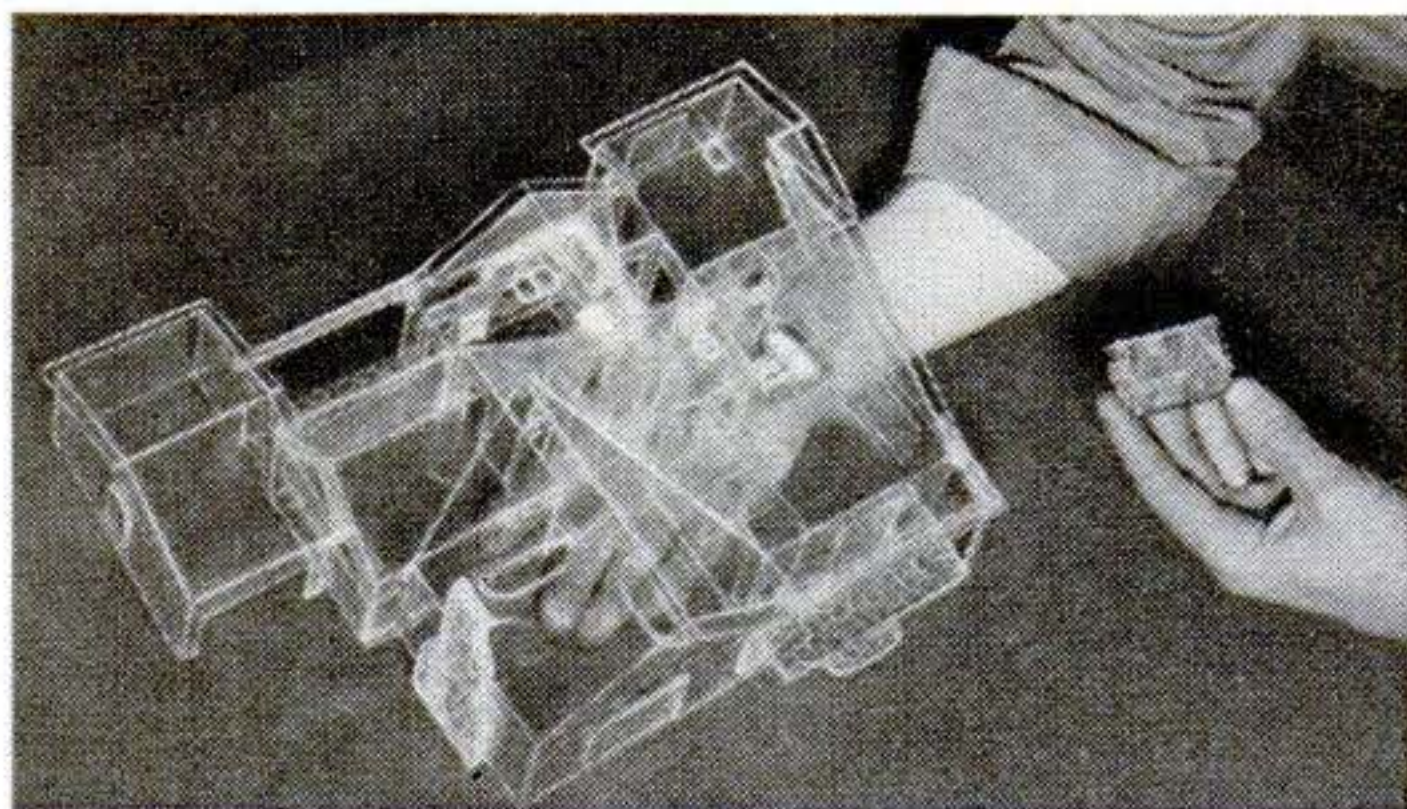
Shannon S. Hughes, Oklahoma City electrician, constructed a transparent plastic model of his own dream home just as a hobby. The hobby has grown into a business. Tools used for making the models are an abrasive wheel for cutting, a rotary electric tool for marking and small detail work, and a file to knock off rough edges.

Plastic sheets 1/16" thick are used for the average house. Larger models require 1/8" thickness. Hughes first outlines and cuts the floor arrangements according to the blueprint. Walls and partitions are cut out and

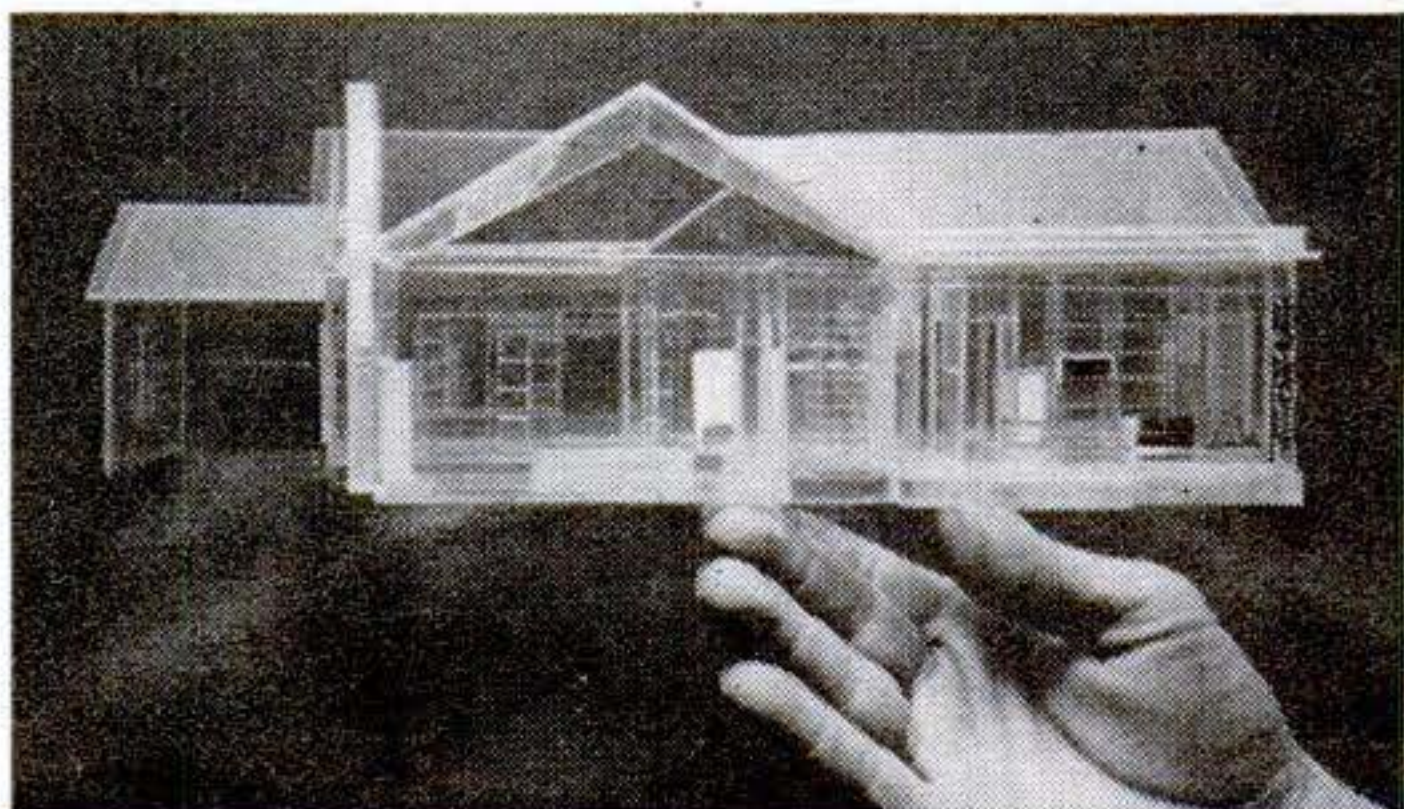
set in place on the floors. Doors are glued to floor and jambs in a swinging position, slightly ajar. Windows and doors are standardized and made up in stock form.

Roofs, Hughes says, are as much work as all the rest of the house together. To save the trouble of making beveled cuts at the ridge, he overlaps one side. Miniature plumbing and kitchen fixtures are installed before the roof is added.

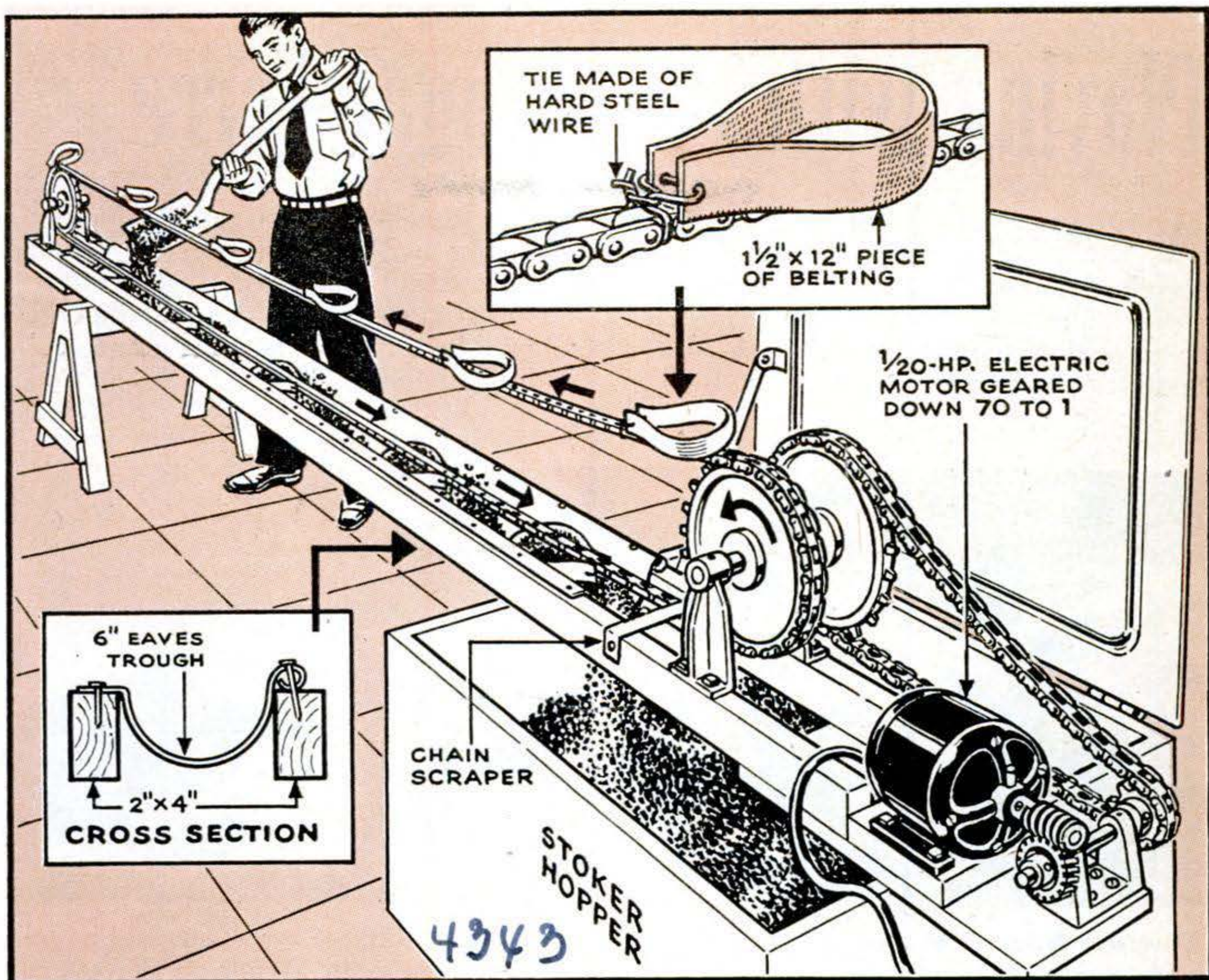
Because plastic can be bent, twisted, and shaped into compound curves, even unconventional modern designs can be modeled. Hughes charges \$6 per \$1,000 up to a \$10,000 home, but has a sliding scale for the larger jobs. He already has sold over 40 models



Hughes displays a 1/20" to 1' miniature house on the right in contrast to the usual 1/4" to 1' scale model held in the other hand.



Window, door and other details are easily perceptible. The models help eliminate constant changing of architects' plans.



Conveyor Moves Coal from Bin to Stoker Hopper

SINCE the distance from my coal bin to the furnace was too far to walk with each shovel of coal, I rigged this conveyor to move the coal from the bin to the hopper above the stoker.

The trough is a length of 6" eaves gutter nailed between two pieces of two-by-four. At each end is a sprocket to carry the conveyor chain. I made the loops that drag the coal along the trough from 1½" by 12"

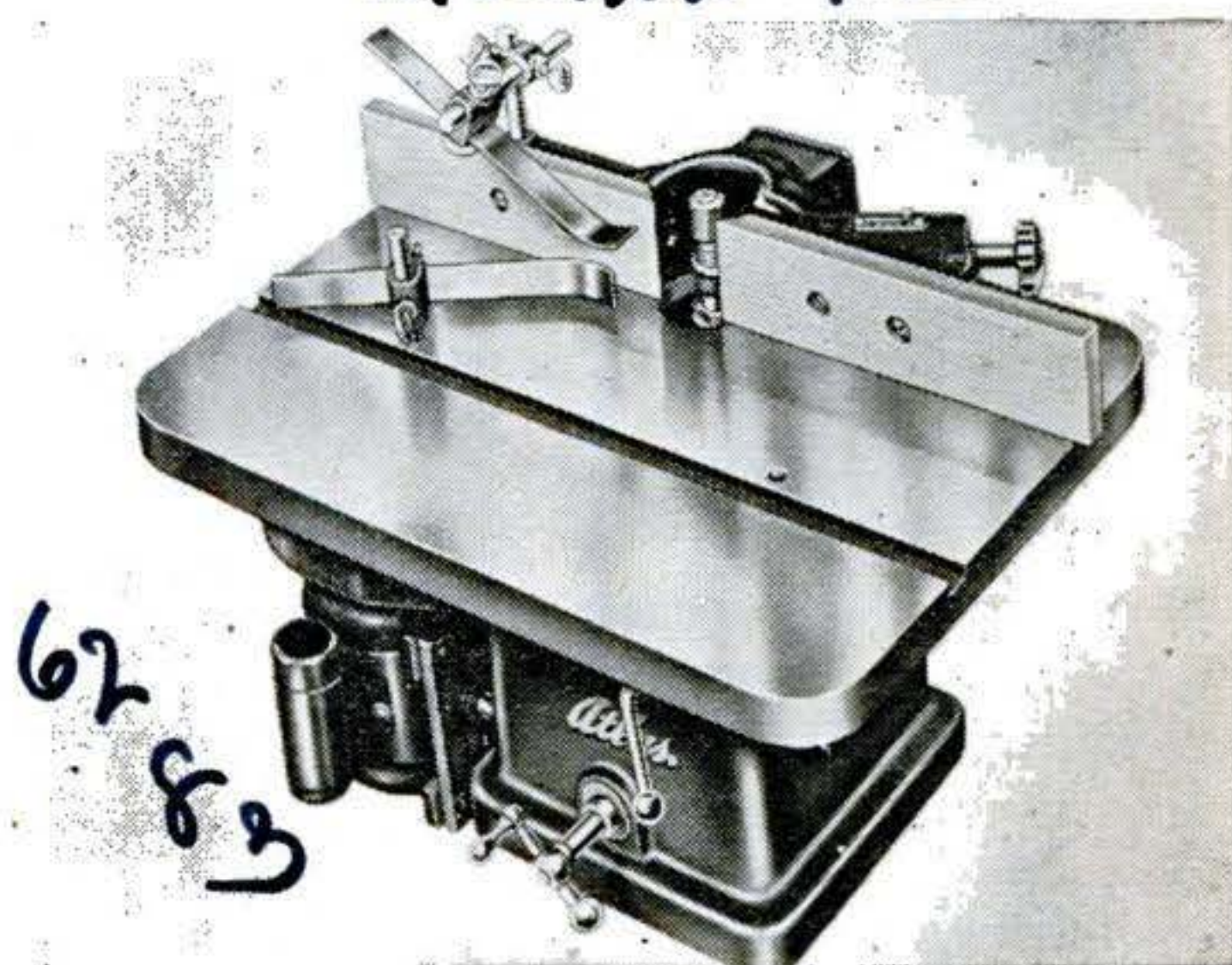
pieces of belting, and wired them to the chain. With the motor geared 70 to 1, I spaced the loops of belting 2' apart. This arrangement moves the coal away as fast as I shovel it into the trough.

Note the scraper just in front of the sprocket nearest the motor. This is a metal strip bolted across the two-by-fours to scrape coal from the chain before it reaches the sprocket.—H. Lester Hunt, Easton, Pa.

Mounted Route 36

Atlas Offers Spindle Shaper

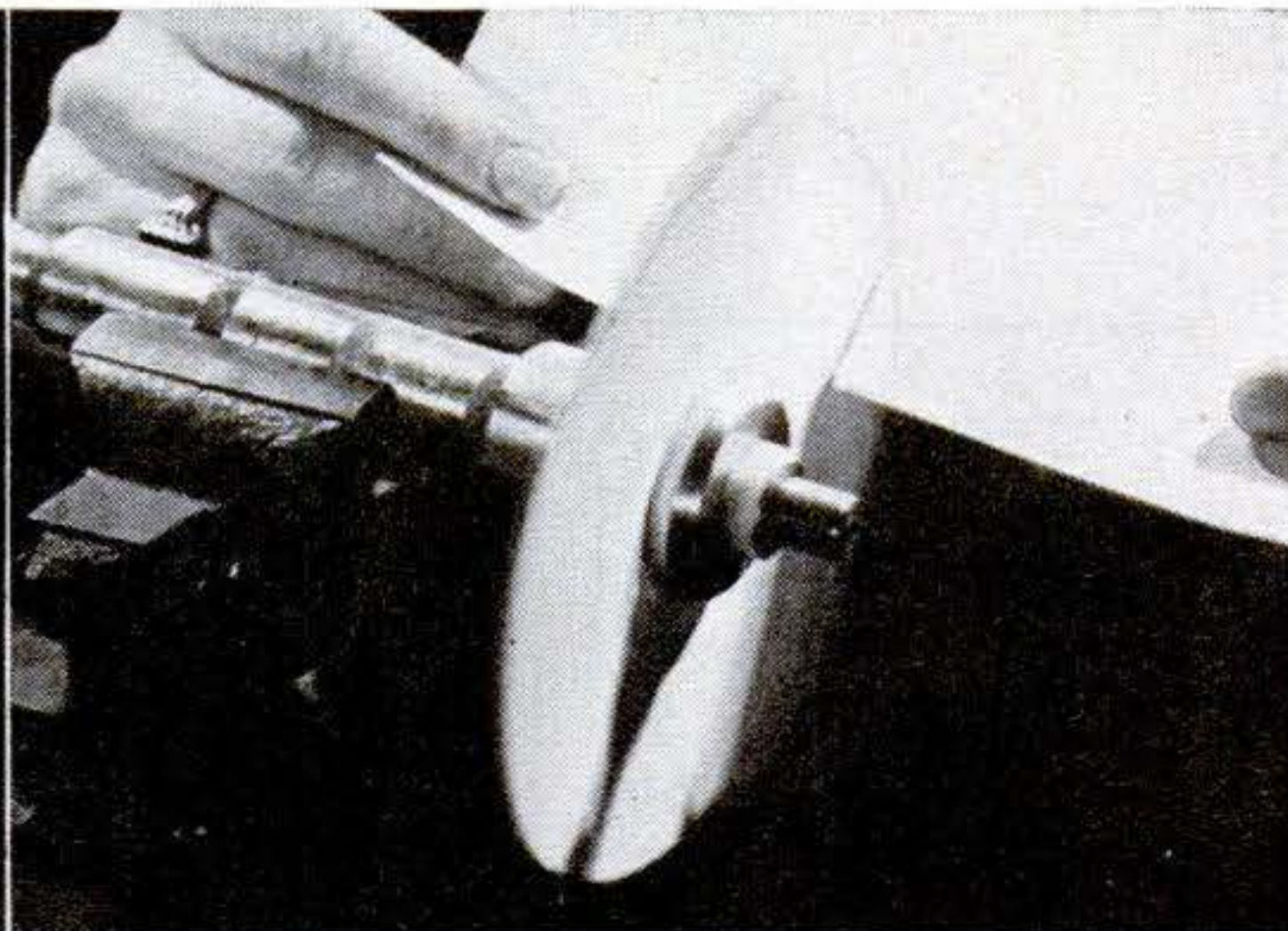
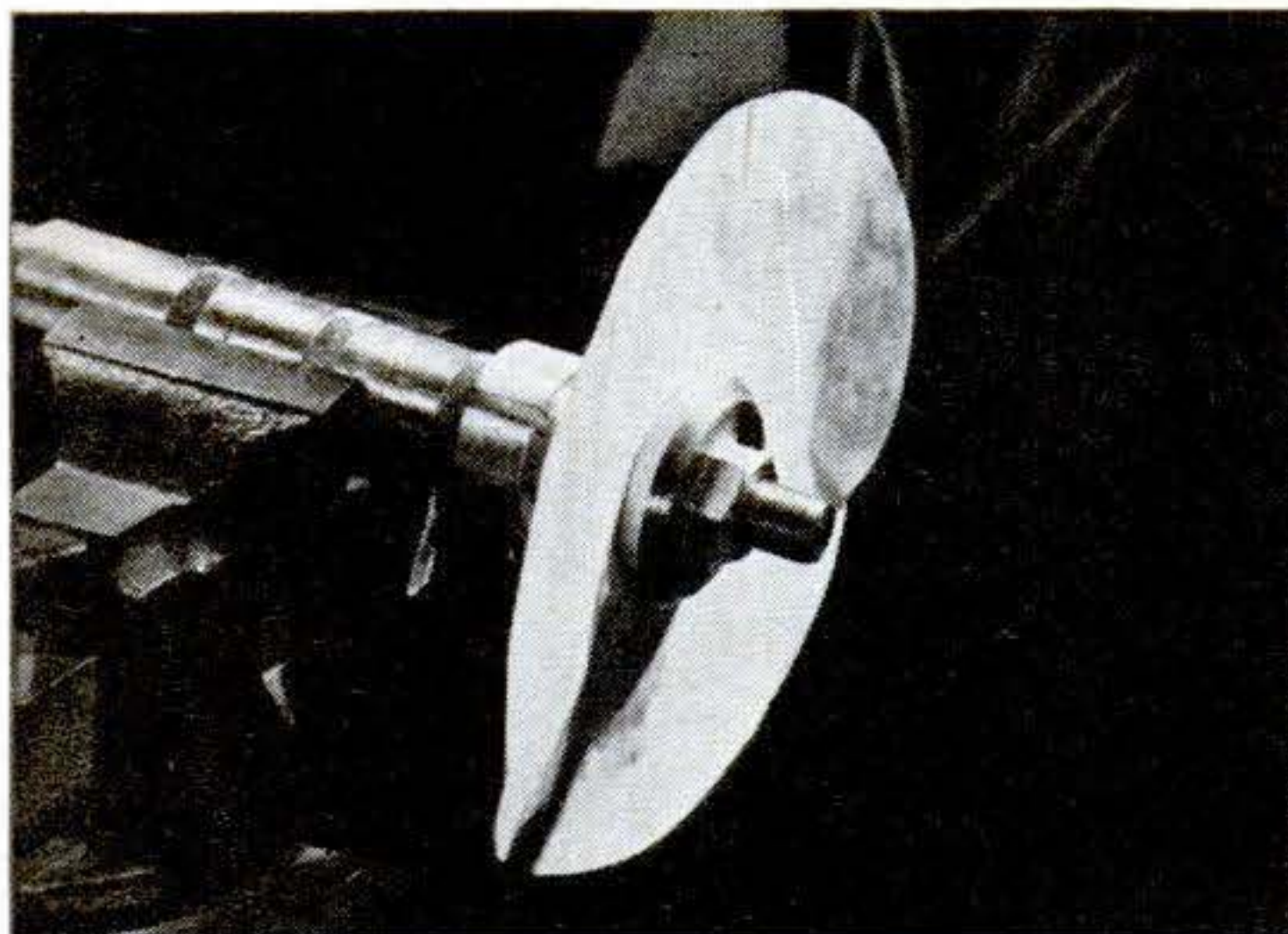
FEATURES of this shaper made by the Atlas Press Co., Kalamazoo, Mich., include a 15" by 21" table with 2" vertical travel, a heavy fence giving 1¼" depth-of-cut adjustment and ½" screw adjustment of one face for planing, sealed ball bearings, and a rear-mounted motor support. The table is drilled for hold-downs and guide pins, and grooved to take a miter gauge and sliding fixtures. Cutters 1½" high and sanding drums 2 3/16" in diameter will fit on the ½" shoulder of the ¾" spindle. The shaper is designed to be operated from a ½-hp., 3,450-r.p.m. motor.



Playing with Centrifugal Force

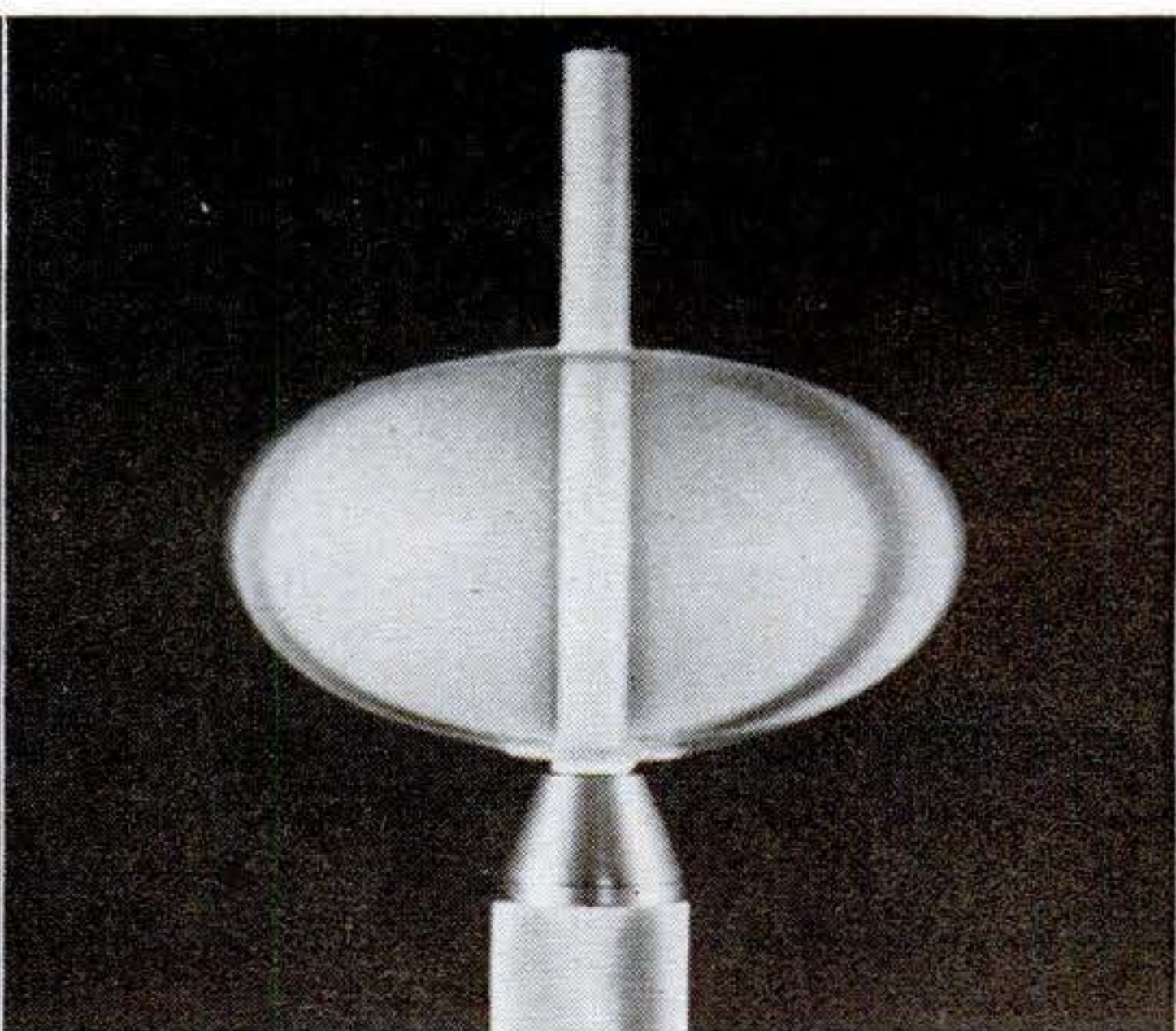
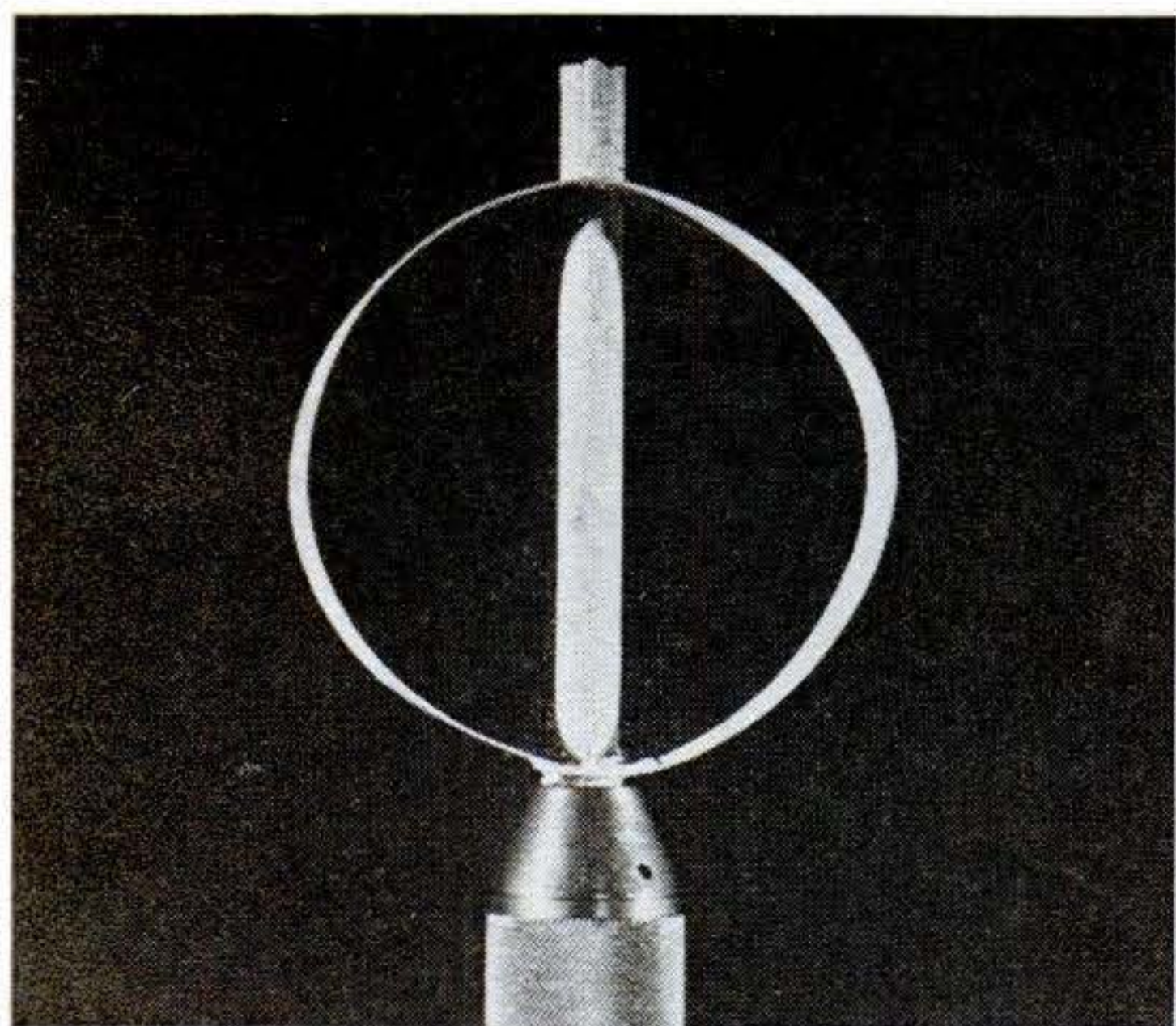
ANY driver who's taken a curve fast knows that a moving body wants to keep traveling in a straight line. Only an outside force will make it do otherwise. Centrifugal force is the strenuous reaction of such a body to any force diverting it from a

straight line. When you whirl a ball on a string, the pull is the reaction to the force you're exerting to keep the ball moving in a circle. Let go, and the ball flies in a straight line. Here are other examples of centrifugal force.



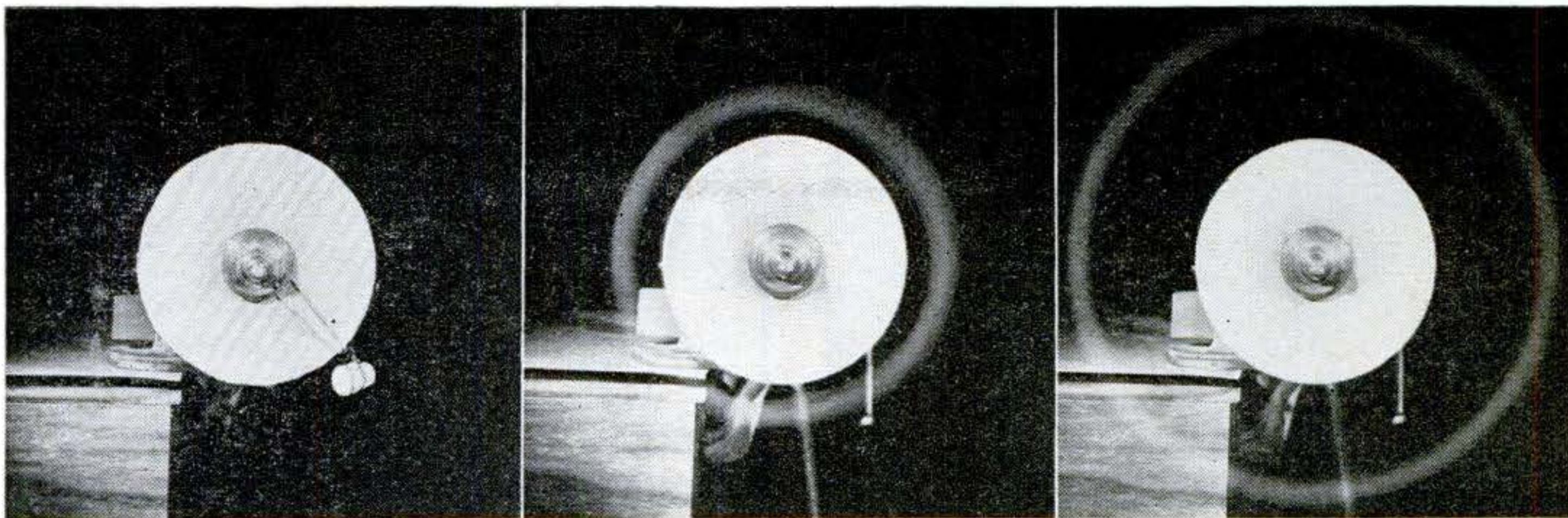
Paper Saws Paper. The faster a body moves, the more force is needed to restrain it to a circular path. Hence, as a reaction, the more force seems to be exerted outward. Above is a demonstration of this.

Mount a 6" disk of typewriter paper on a motor-driven shaft. While motionless, the paper is quite limp. But rotated at high speed, the disk becomes so rigid that it will easily saw through a sheet of paper.



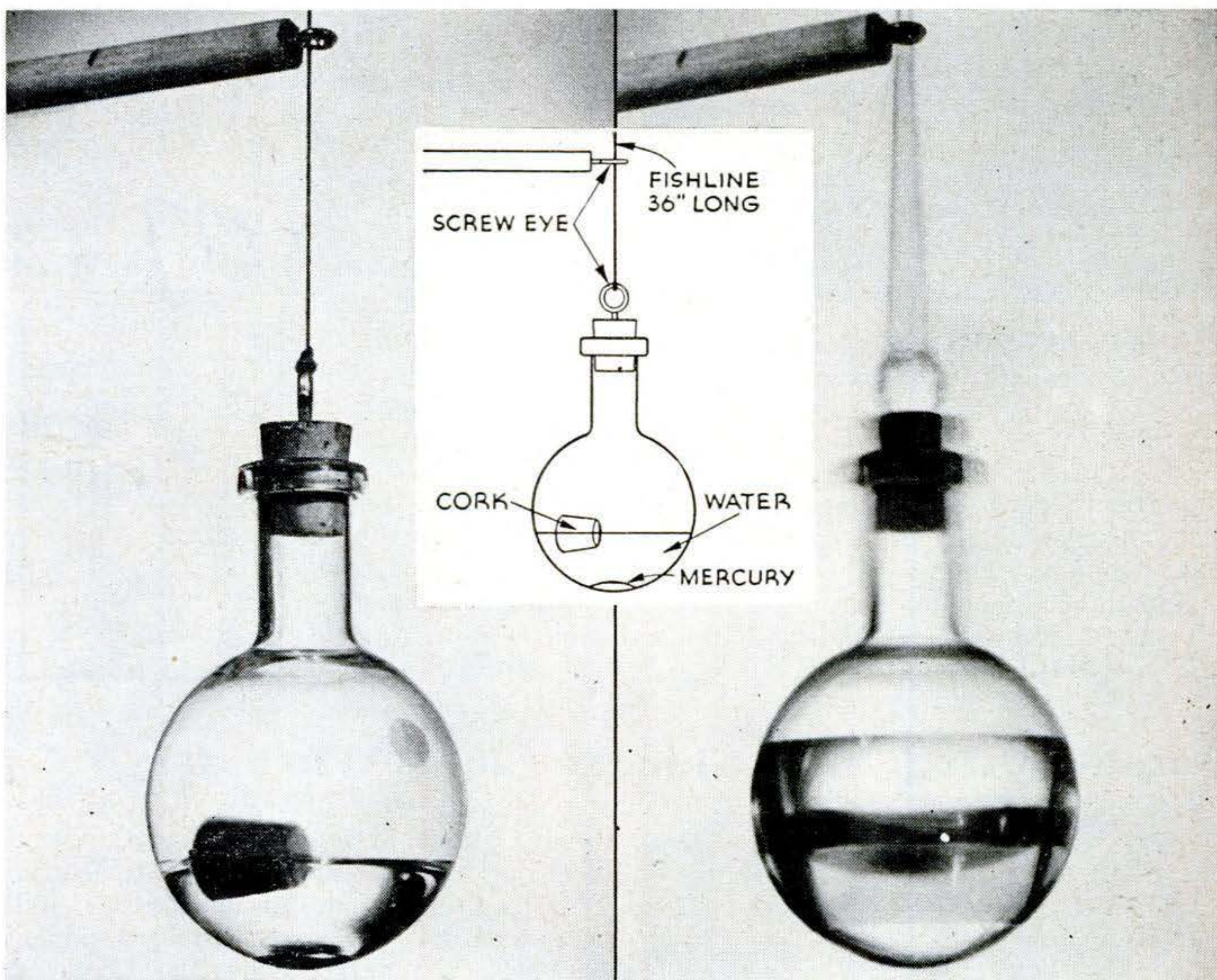
How a Governor Works. As a rotating body speeds up, the tendency to fly outward becomes greater. This is put to use in the centrifugal governor. You can show the operation of such a governor by forming a strip of 1" cardboard into a 6"

ring and pushing a dowel through holes on opposite sides. Make the ring a loose fit on one side. Cement it to the dowel on the other. Mount the dowel in a drill or flexible shaft held vertically. The ring flattens more and more as it turns faster.



Rotation Versus Gravity. Although the earth revolves at about 1,000 m.p.h., the pull of gravity toward its center keeps us safe. Theoretically, if the earth speeded up to a certain point we'd all fly off. Here's a setup to show the relationship between rotating speed and a center-pulling

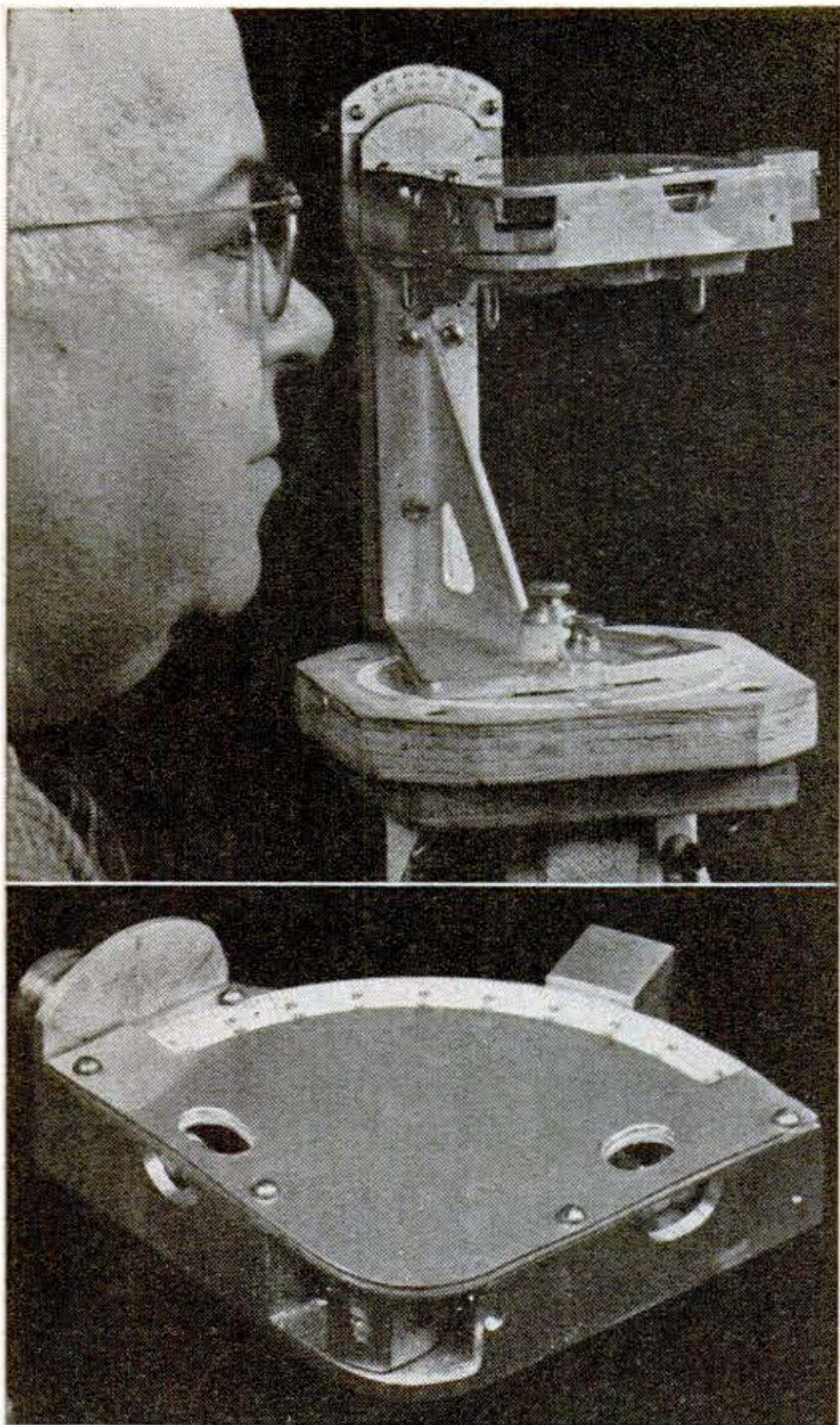
force. The latter here is exerted by two rubber bands slightly shorter than the radius of a cardboard disk that's mounted on a motor shaft. At moderate speed, a small cork tied to the joined rubber bands remains near the disk. But speed up the motor and the cork flies out in a widening circle.



Simple Centrifuge. At a given speed of rotation, dense substances have a stronger tendency to fly outward than light ones. Centrifuges and cream separators work on this principle. Here's a homemade centrifuge. Twist the string until it has shortened

about 4". Then let it go. As the flask rotates, the liquids climb the sides, as at right. At top speed, the mercury forms a narrow band at the middle of the flask, with water above and below. The light cork whirls about in the center.

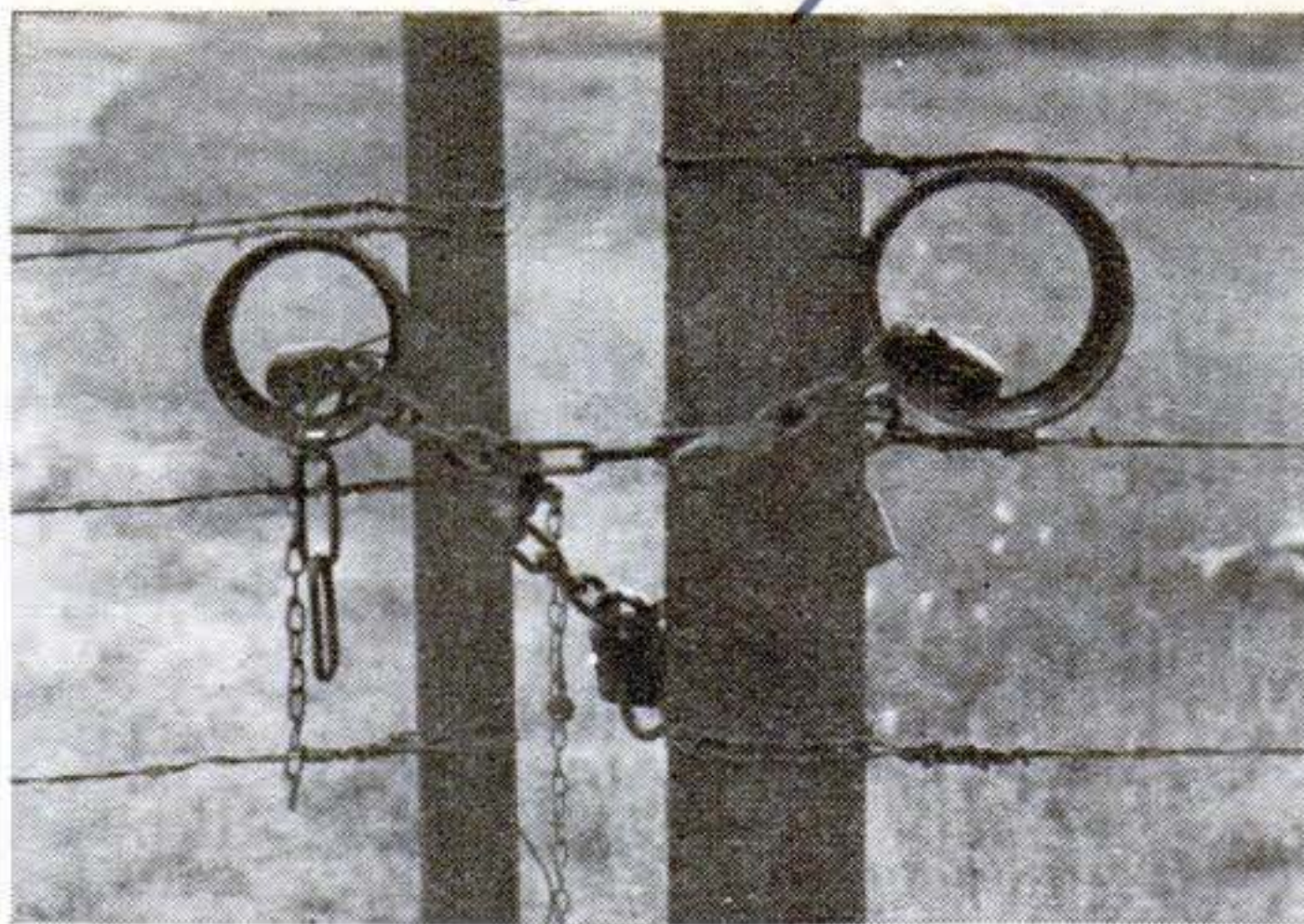
6178



Simple Transit for Amateurs

You don't need to be an engineer or a surveyor to use this new quadrant transit, according to the maker, Fenton Crafts, of Fenton, Mich. Farmers, carpenters, and others can use it to run lines for roads, foundations, building lots, fences, ditches, and other jobs. The assembly includes an aluminum head mounted on a swivel stand, a leveling base, and a 54" adjustable tripod. It is priced at about \$20.

6204



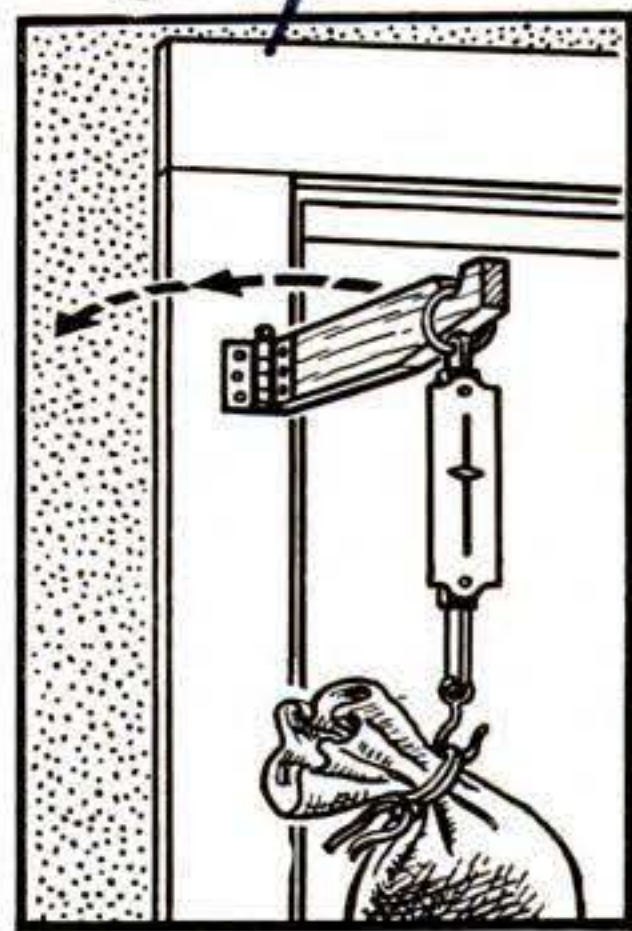
Many Locks Hold Public Gate

TO AVOID distributing numerous keys to a single padlock, each of several companies having access to a community area here uses its own lock—all being joined by short lengths of chain. Thus the unlocking of any lock will open the gate, and responsibility can be fixed on anyone leaving it open. Pipe collars were welded to the post and to the gate, the chains and locks passing through them. This makes it easy to rotate the string, preventing the chains from catching on the barbed wire.—*Elton Sterrett, Houston, Texas.*

4477

Scale Support Hinged to Wall

A PIECE of wood, hinged to a barn wall or door frame, makes a handy support for weighing feed or chickens. When not in use, the bracket swings out of the way. Cut or saw a notch at the end for the scale hanger.—*Paul Criton, Jr., Kayville, Sask.*



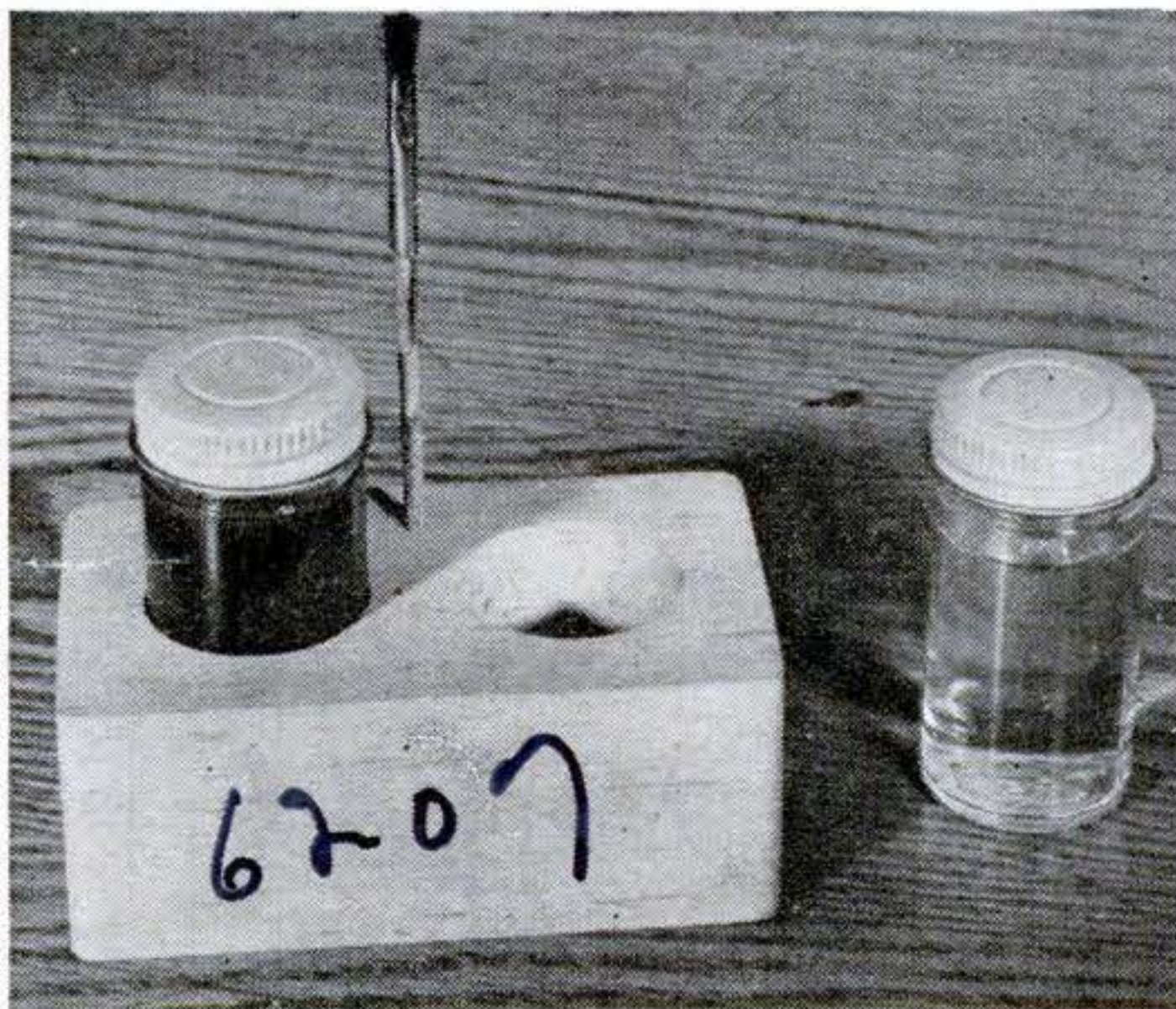
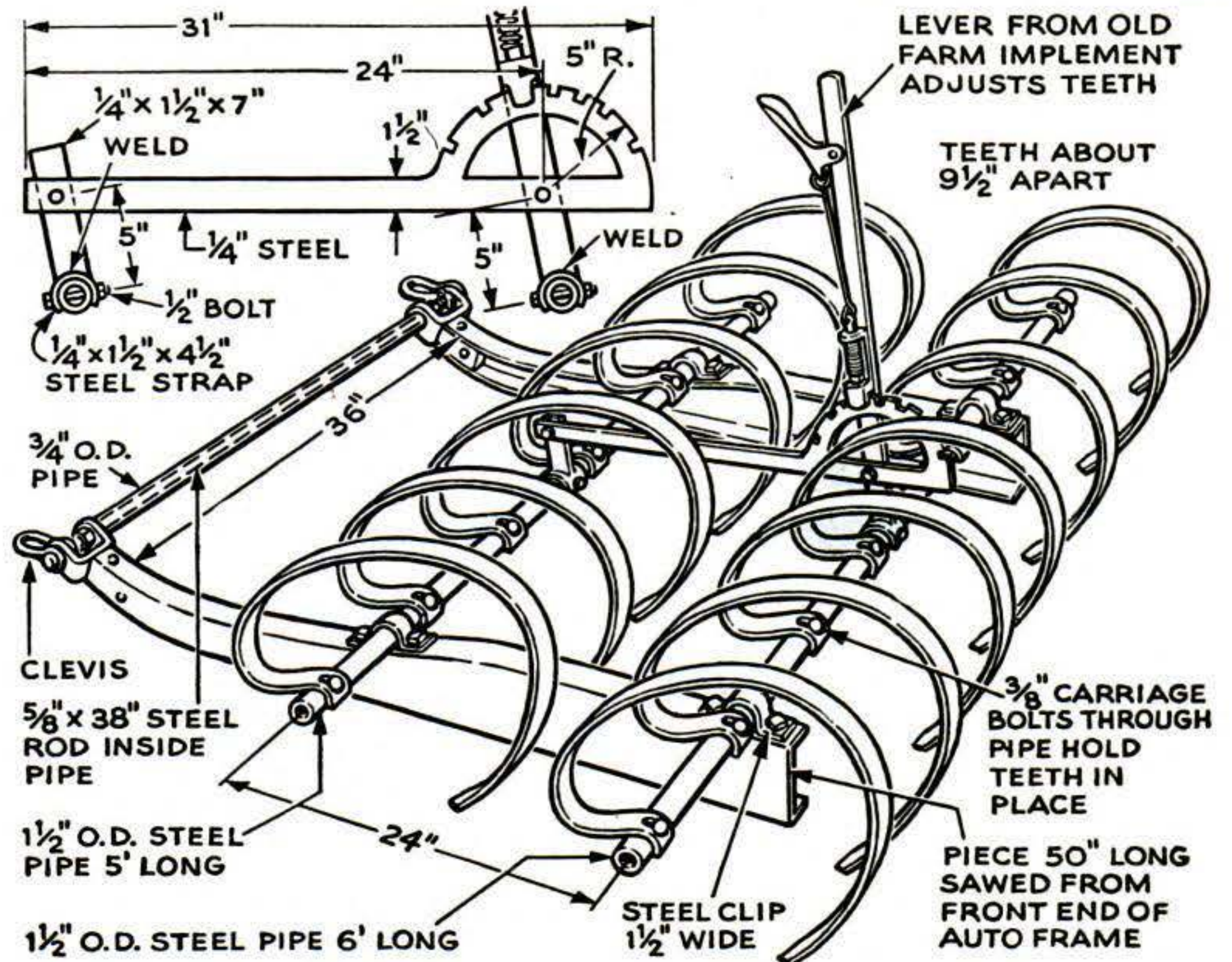
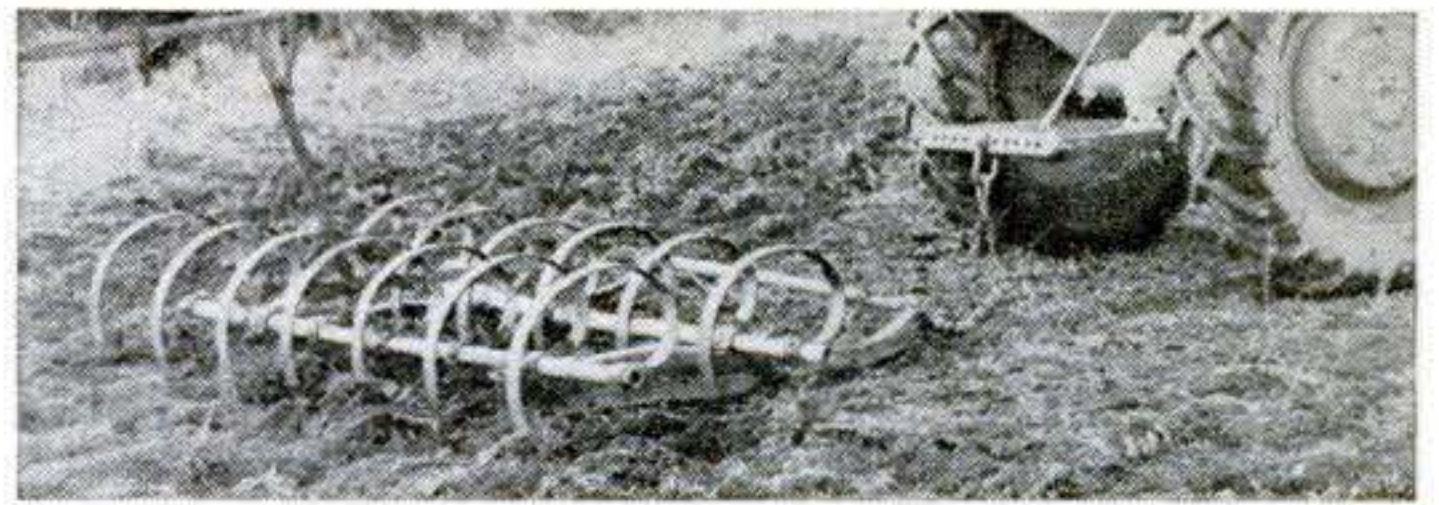
Quick-Setting New Glue Is Clear When Dry



THIS new glue, Cascorez ®, looks like library paste and spreads as smoothly, but becomes transparent when dry. It sets in from 20 to 30 minutes on most woods, and almost instantly on balsa, cardboard, paper, and fabrics. Developed by the Chemical Division of the Borden Co., it was tested by technicians on typical home gluing jobs, including furniture construction, veneering, inlay work, and household repairs. The glue was first made for the lamination of auto safety glass.

1491 Framework for Harrow Cut from Old Auto Chassis

THE front section of an auto frame and two pieces of 1½" pipe form the base of this heavy-duty harrow built by Art Johansson, of Poulsbo, Wash. Note that the spring clevis left on each chassis piece was used to hold the spacer and steel rod. The teeth, taken from an old harrow, are set about 9½" apart with the center tooth of the rear row located on the centerline of the frame. Like the teeth, the adjusting lever was borrowed from an abandoned harrow (it could be cut from ¼" cold rolled steel). In attaching this mechanism, care was taken to mount both lever arms vertical to the frame when the tips of the teeth were level with the bottom of the runners. The drag chain is attached right to both clevises.—Edward R. Lucas, Poulsbo, Wash.



Glue Well Keeps Bench Neat

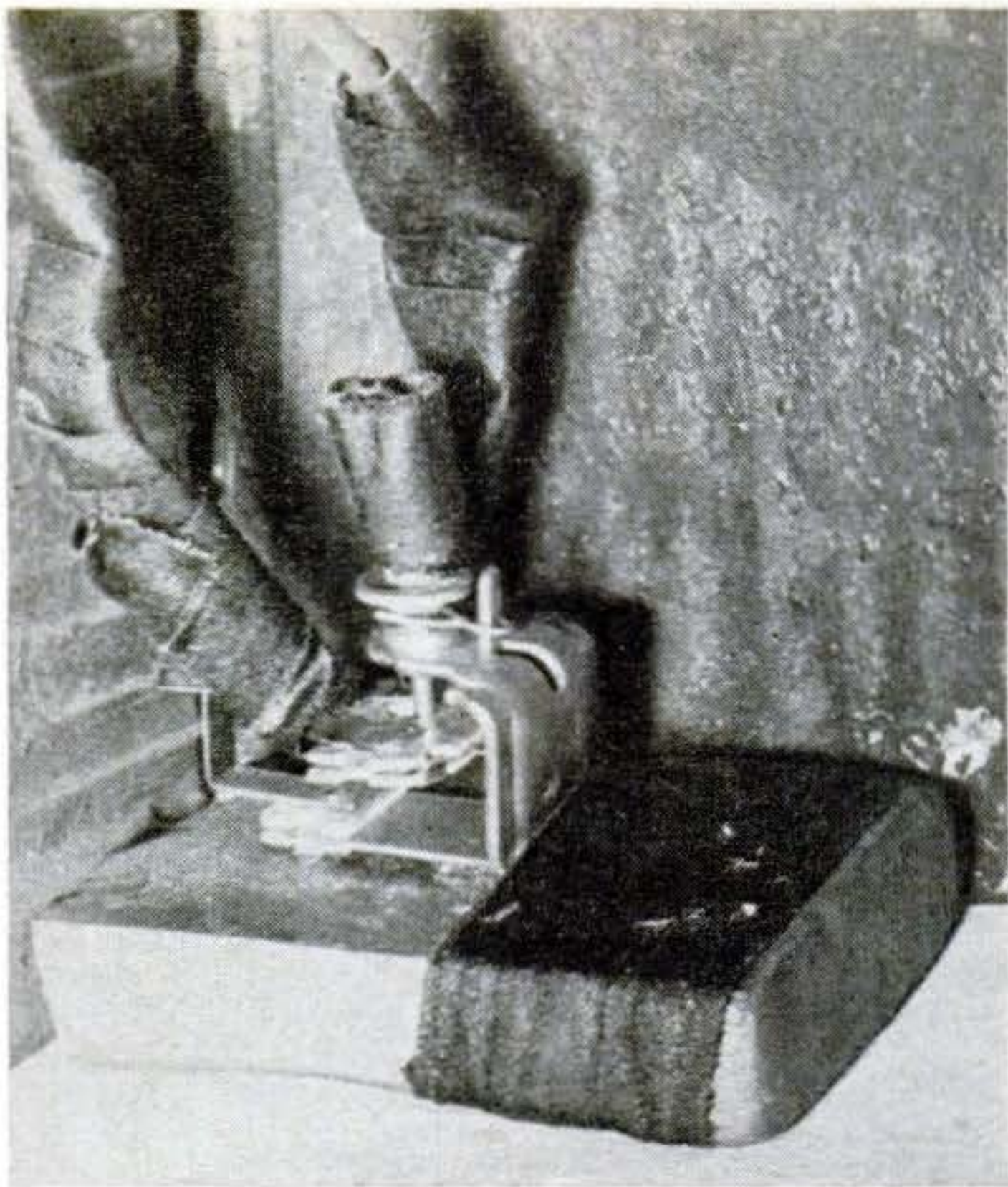
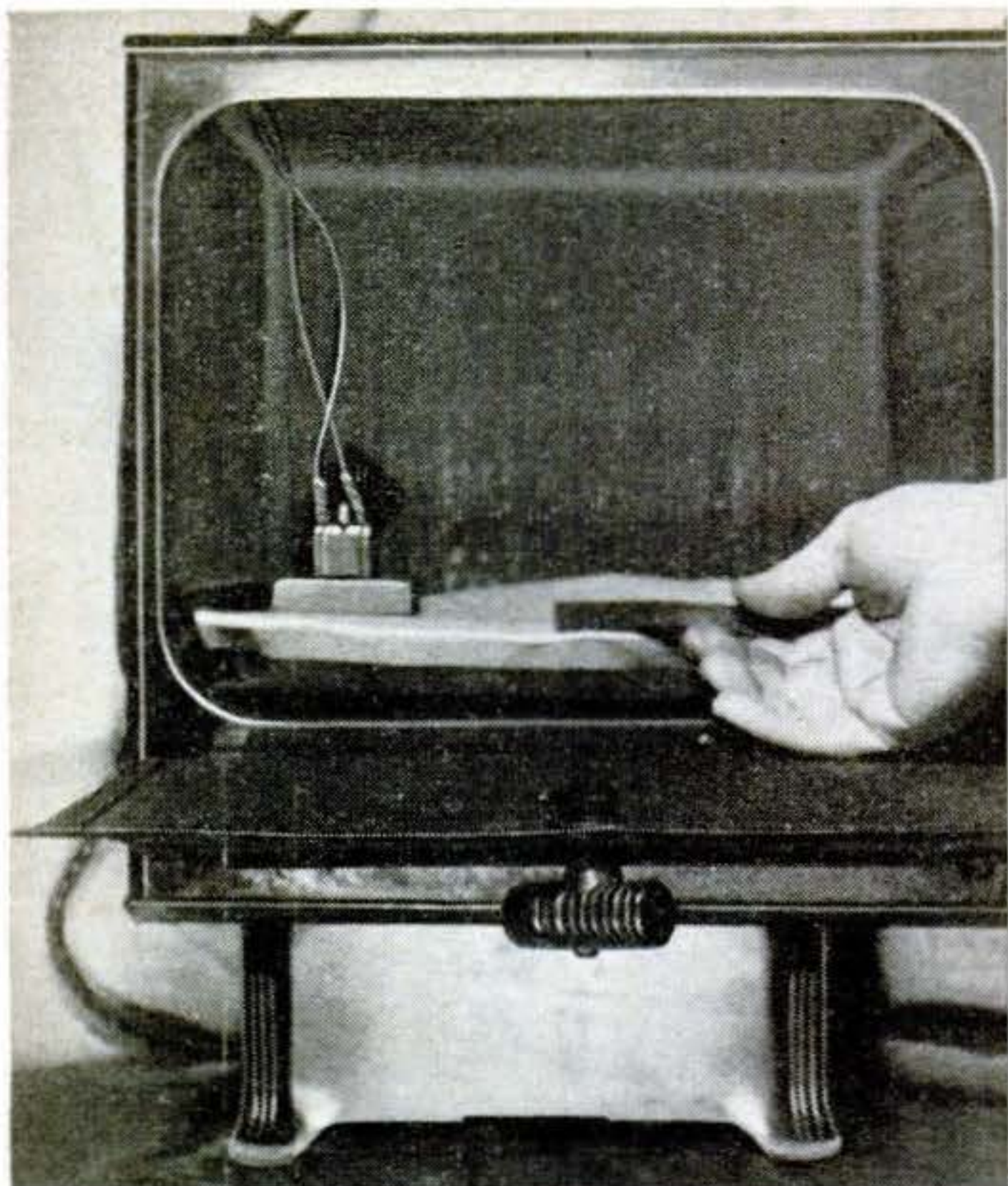
A COUPLE of small jars set in a block of wood can be temper savers. One jar holds glue and the other water. When you're gluing up small parts, put the brush in the water jar instead of laying it on the edge of the workbench. Then when you finish the job, stick the brush upright in its hole to dry, and screw the caps on the two jars.—Herbert Pfister, Bronx, N. Y.



Cigarettes Pop Out of New Case

AS THE chrome-plated top of this lightweight plastic case is slipped back, each cigarette pops up from its individual compartment. Rows are staggered, so one smoke is released at a time. The case, which holds a full pack, is manufactured by the Premier Plastic Corp., of Chicago, and is priced at about \$2. It is available in black, emerald, or maroon.

1052



Electric Shop Oven Softens or Cures Plastic

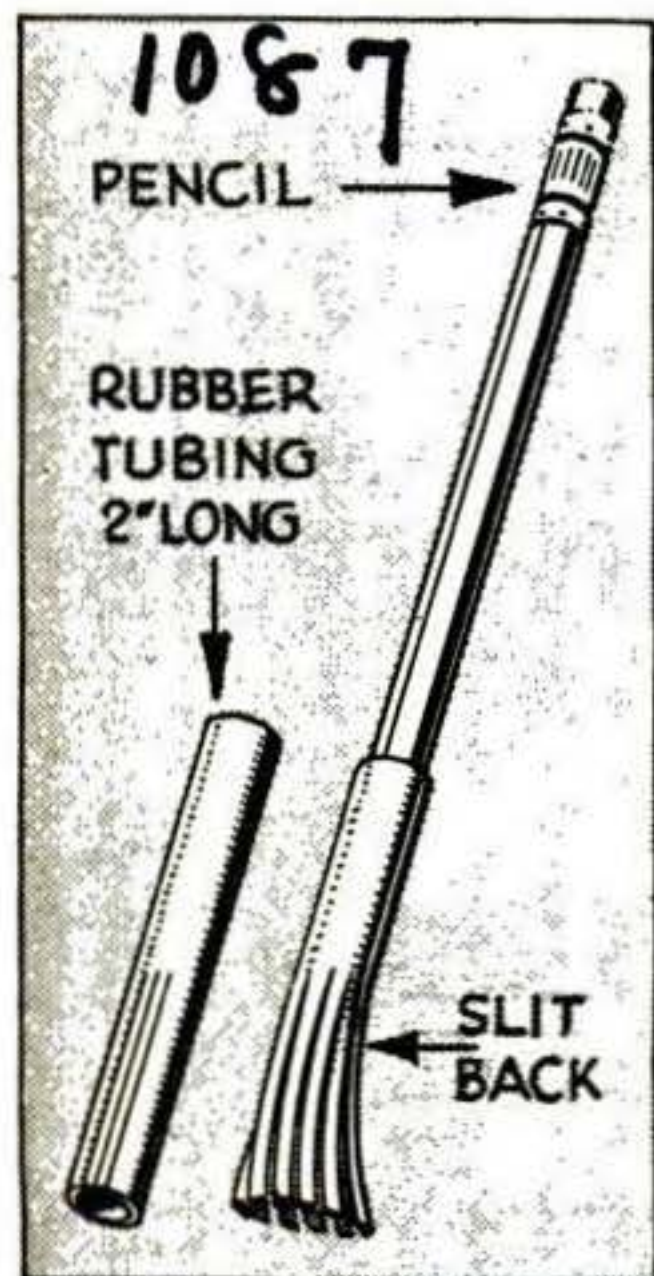
You can soften thermoplastic in the kitchen oven, but trying to form it without the conveniences of your workbench will soon convince you that a shop oven would be a fine thing. I built an automatically controlled one for less than \$7, of which \$2 went for a used range-top oven and \$3 for a new electric hot plate.

The oven is mounted with bolts and brackets so that no part of it touches the heating coil. Temperature is controlled by an adjustable thermostat of the kind used in electric irons. This turns the current on or off to maintain any preset heat for shaping or curing plastics. It pays to buy an oven

thermometer (they cost only a few cents) for setting the thermostat. Mount the thermometer well inside.

Place an asbestos pad in the bottom of the oven to protect the control element from the direct heat of the coil. Otherwise it won't respond to the true oven temperature. You can fasten the 'stat to an asbestos block with friction tape, but bolts make for a more permanent job. Cut one of the two wires leading to the hot plate apart, and connect the cut ends to the two thermostat terminals. To avoid shocks, wrap all exposed electrical contacts well with tape.—*Thomas A. Dickinson, Los Angeles.*

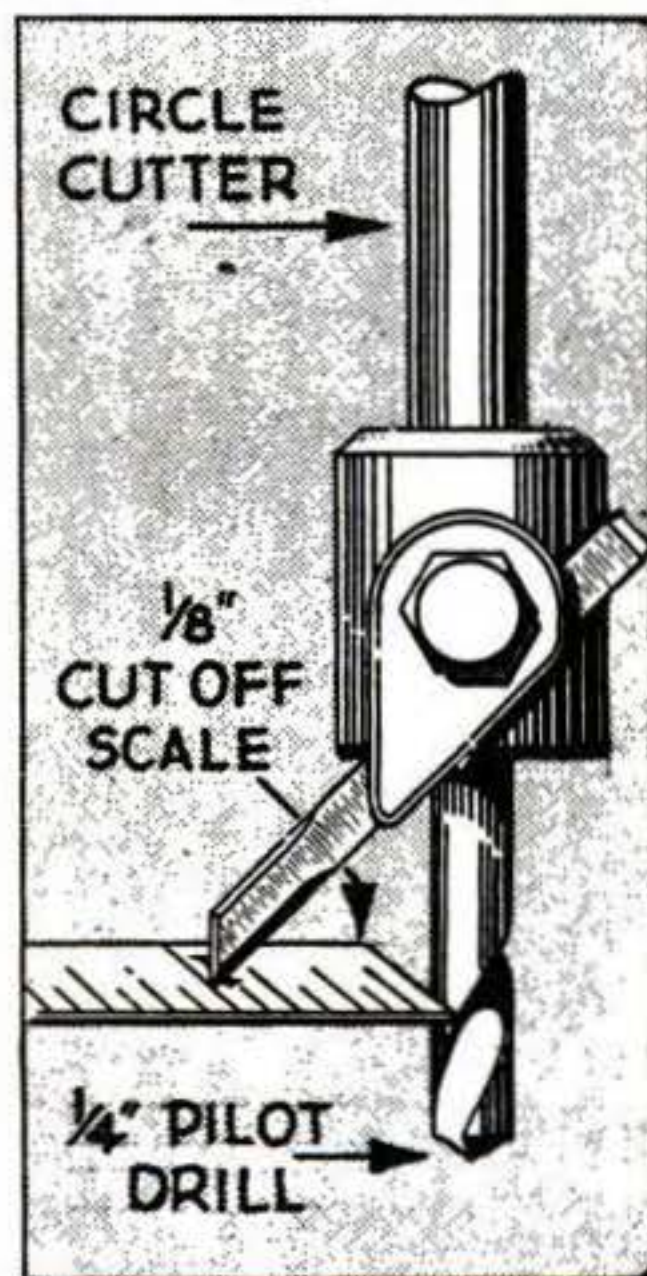
Slit Hose Forms Glue Brush



NEEDING a glue brush that had vanished from my cellar bench, I made a hurry-up substitute that proved so good I'm still using it. A 2" length of soft windshield wiper hose was partly slipped on an ordinary lead pencil. Then 1" of the hose was slit into strips 1/16" wide with scissors.—*George Predential, Schenectady, N.Y.*

Doctored Rule Sets Fly Cutter

A FRAGMENT of an old steel rule or tape will help you set an adjustable hole cutter right the first time. Measure the shank of the pilot drill. Then grind an amount equal to half the shank diameter off the end of the rule, shortening the first inch. Read settings right off the shortened rule as at right.—*Carl F. Bareis, Philadelphia.*



74132

**NOW... LIGHT
WHEN YOU NEED IT!**

**Ray-O-Vac LEAK PROOF batteries
stay fresh for years!**
(because they're sealed in steel!)



© 1948 BY RAY-O-VAC COMPANY, MADISON, WIS. RAY-O-VAC, CANADA LTD., WINNIPEG, MAN.

See how much more you get

in these truly modern batteries. Each Ray-O-Vac Leak Proof starts with a powerful, well made battery. Then...

1. Steel bottom is added.
2. And a steel top.
3. Next—multiple insulation. Nine layers of protection against corrosion.
4. Last—a steel jacket. This completes an air-tight seal, to stop corrosion and keep the battery fresh and powerful. Only Ray-O-Vac builds batteries with all four of these safeguards.

GUARANTEE on every Ray-O-Vac Leak Proof: "If your flashlight is damaged by corrosion, leakage or swelling of this battery, send it to us with the batteries and we will give you FREE a new, comparable flashlight with batteries."

Ask for Ray-O-Vac Leak Proofs

Buy Spares... *they stay fresh*

Dependable

CHAMPION

America's Favorite Spark Plug



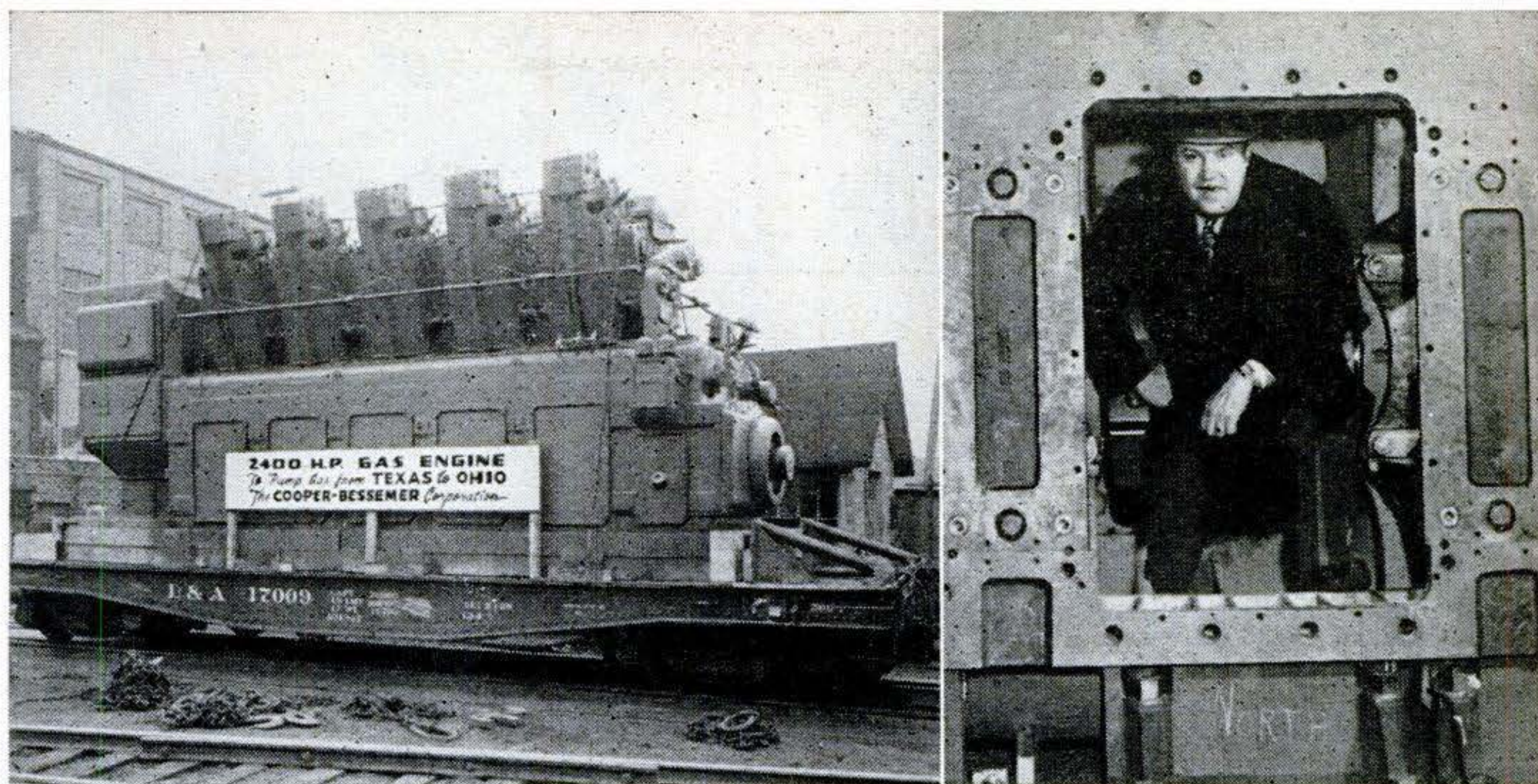
Weather-wise ducks are flying south, and weather-wise motorists are installing new dependable Champion Spark Plugs. It's the best, most economical insurance of snappy winter engine performance if new ones are needed. New Champions insure quick starts, minimum battery drain, and better gas mileage

all winter long, when gas consumption is usually up. Insist on dependable Champions—America's Favorite Spark Plug—because they're tops in quality, value, performance and dependability. A quacking duck poster will remind you—"HERE COMES WINTER!" Champion Spark Plug Company, Toledo 1, Ohio.

FOLLOW THE EXPERTS

DEMAND NEW DEPENDABLE CHAMPIONS FOR YOUR CAR

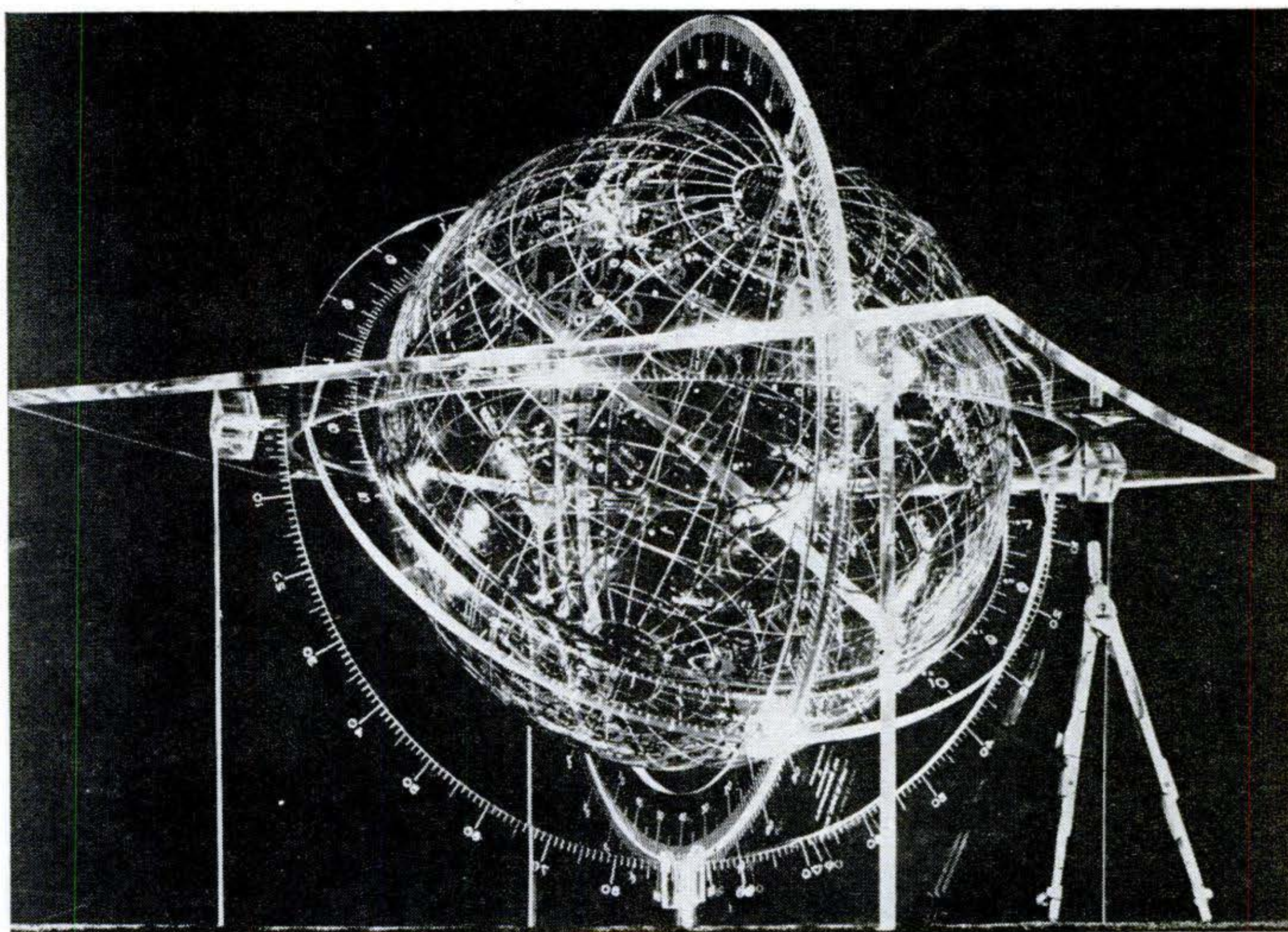
Listen to the CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over the ABC network



Giant Engine Pumps Gas

NATURAL gas piped from Texas to Ohio will get a big boost from this giant, 24,000-hp. gasoline engine. Largest of its kind, the

Cooper-Bessemer engine drives a compressor that will help pump the gas. Its ten cylinders have an 18-inch bore and a 20-inch stroke. Its crankcase alone (right) is 12 feet 2 inches high and weighs 30 tons.



Globe Aids Star Study

AMATEUR astronomers needn't do a lot of mathematical pencilwork with this clear, all-plastic celestial globe. A graduated base

and two movable rings make it possible to determine directly the positions of the stars and the paths of the planets. The 9-inch globe is made by Farquhar-Kugler. Its luminescent markings glow in the dark.

THE KODAK LINE-UP HAS A

Special

Better pictures
with
the right camera



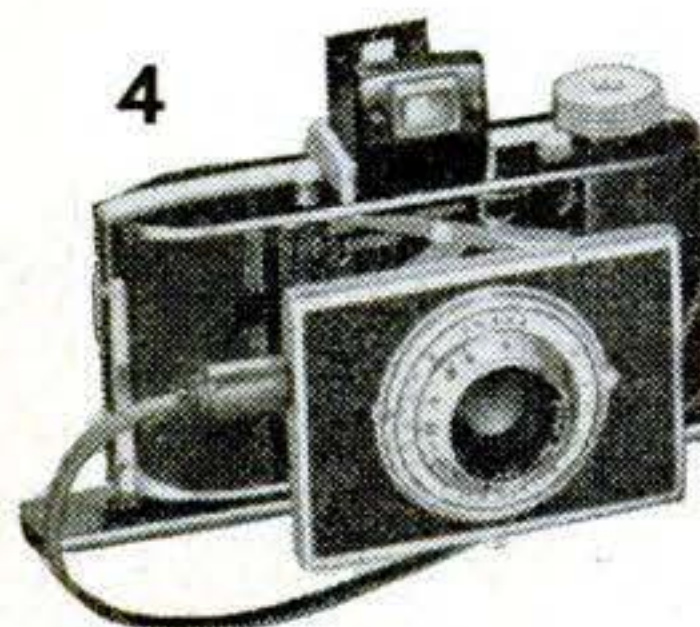
2



1



3



4



1 KODAK REFLEX CAMERA—Twin lenses—4-element $f/3.5$ for speed, *Lumenized* for brilliance, superbly corrected for sharpness, for beautiful color. 1/200 Flash Kodamatic Shutter. Black-and-white pictures, $2\frac{1}{4} \times 2\frac{1}{4}$; Kodacolor snaps, about 3×3 . With field case, \$120; Flashholder, \$9.50.

2 KODAK 35 CAMERA WITH RANGE FINDER—*Lumenized* $f/3.5$ lens yields superb color transparencies and prints, sharp black-and-whites for big enlargements. Coupled range finder. 1/200 Flash Kodamatic Shutter. Automatic shutter cocking, double-exposure prevention. \$75; Flashholder, \$9.50.

3 KODAK TOURIST CAMERA—Finest folding model yet. Hard-coated $f/4.5$ lens, 1/200 shutter. Built-in exposure computer. Efficient new-type shutter release on bed of camera. Black-and-white pictures, $2\frac{1}{4} \times 3\frac{1}{4}$; color snaps, about $3 \times 4\frac{1}{2}$. \$61.50; also lower-priced models. Flashholder, \$9.50.

4 KODAK FLASH BANTAM CAMERA $f/4.5$ —Small, light, moderately priced. Makes sharp black-and-white negatives; also full-color Kodachrome transparencies for projection on the home screen and for Kodachrome Prints and Enlargements. *Lumenized* $f/4.5$ lens, 1/200-second shutter. \$50; Flashholder, \$9.50.

EASTMAN KODAK CO.

"Kodak" is a trade-mark

Gift

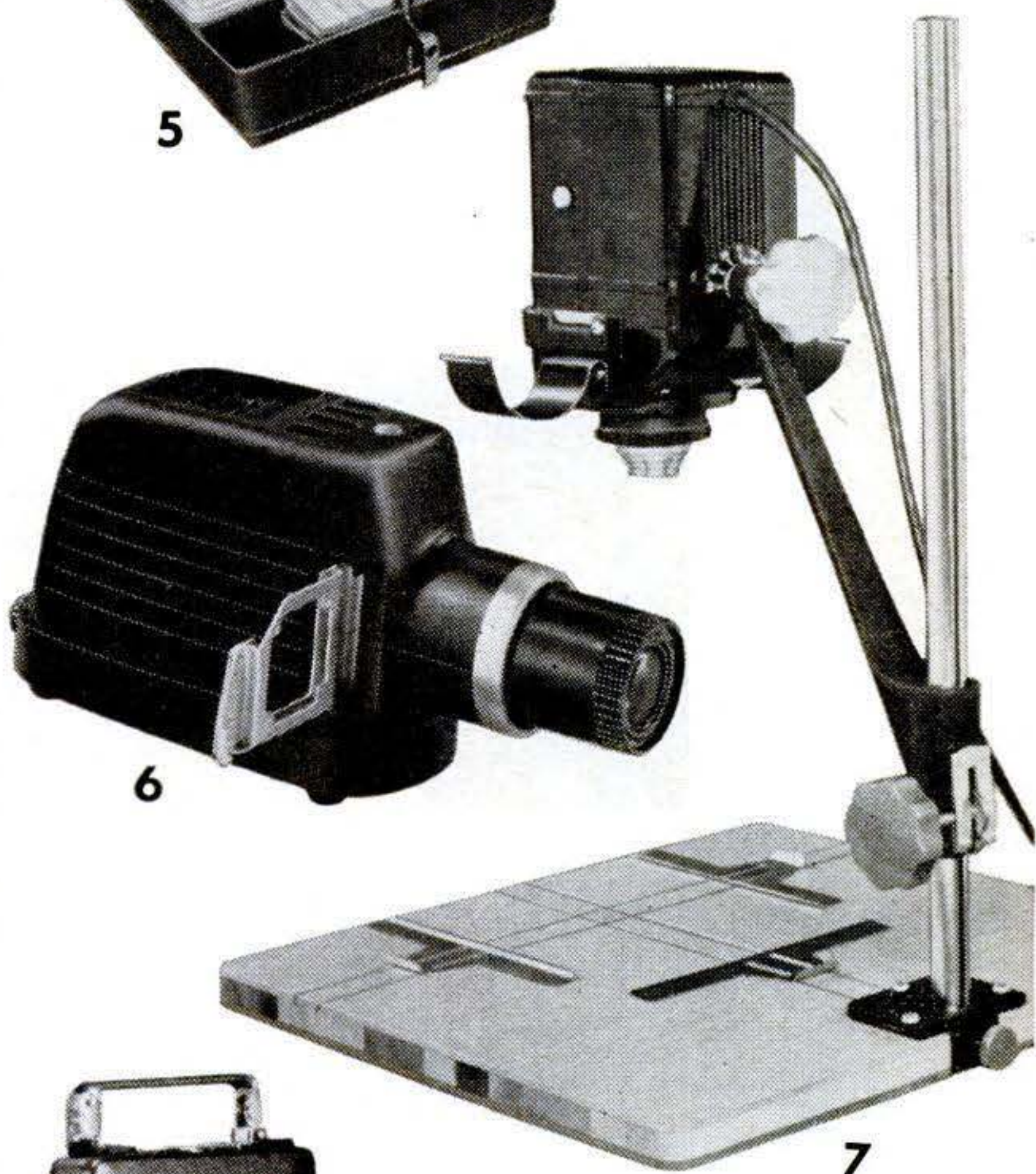
FOR YOUR FAVORITE FAN

5 KODASLIDE TABLE VIEWER—entirely new type of projection viewer for 2x2 cardboard or glass slides, or a combination of both. Superb for small group shows, editing, and quick viewing. 7½x7½-inch Kodak Day-View Screen gives brilliant image in lighted room. Has *Lumenized* f/3.5 lens (Kodak Ektanon), slide changer, cooling system, focusing lever. \$95.



More fun
with
the right accessory

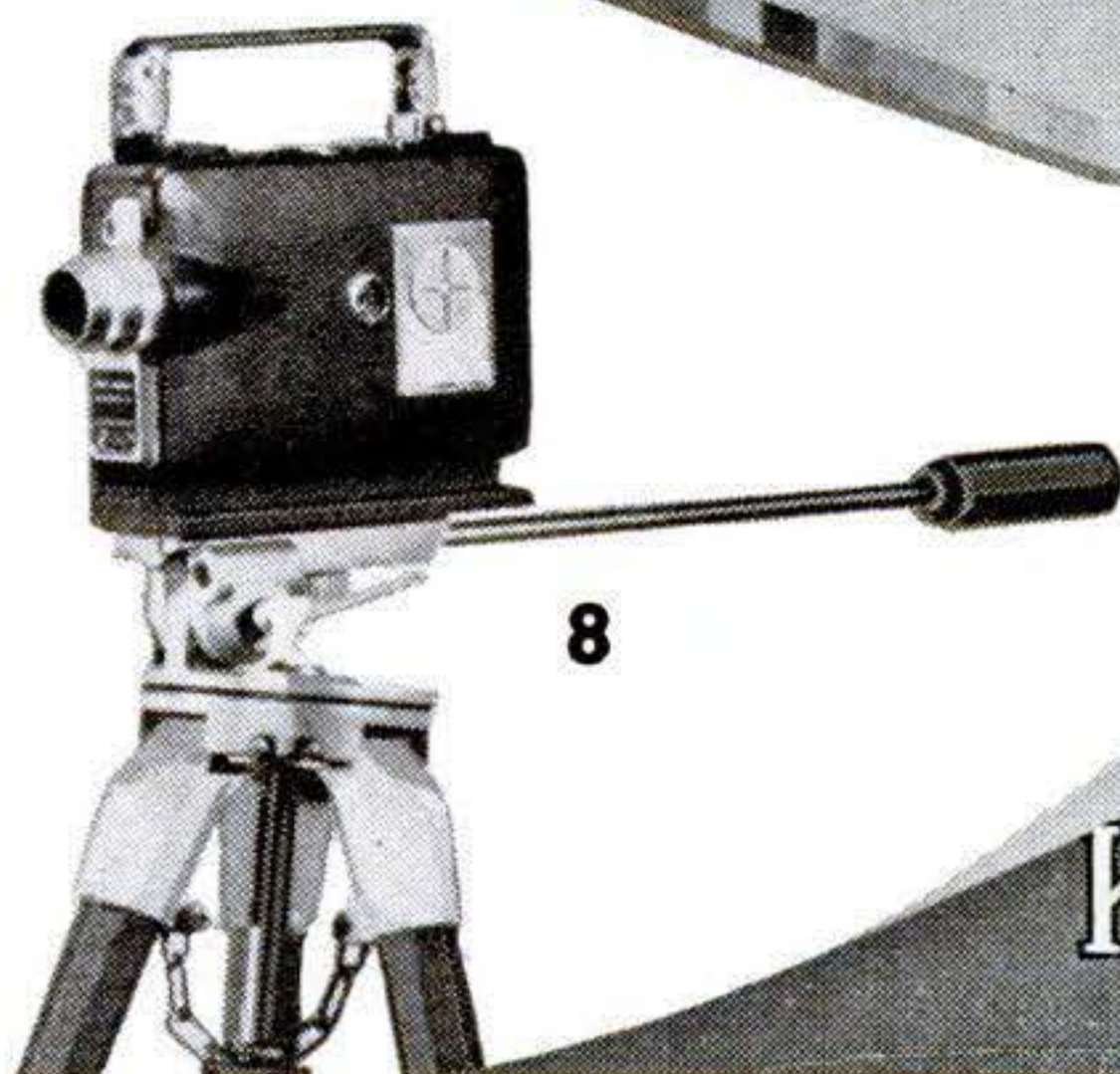
6 KODASLIDE PROJECTOR, MODEL 1A—takes 2 x 2 cardboard or glass slides. Projects big, bright images up to 84 inches wide. Sharp focusing with the Kodak Projection Ektanon Lens, 4-inch f/3.5. *Lumenized* optical system increases screen brilliance 50%. \$27.50.



7 KODAK PORTABLE MINIATURE ENLARGER—blows up 35mm. or Bantam negatives. Three-lens condenser system, heat-absorbing glass, 50-watt lamp insure high-quality prints. Price, \$48.50. Pack-All Case is ideal storage place... handy for trips. \$15.

8 KODAK TRIPODS—all types of camera supports for movie or still cameras—for all-round better pictures. Wide price range. Visit your nearest Kodak dealer for a complete review of the Kodak line-up.

(Prices, subject to change without notice, do not include tax where applicable.)

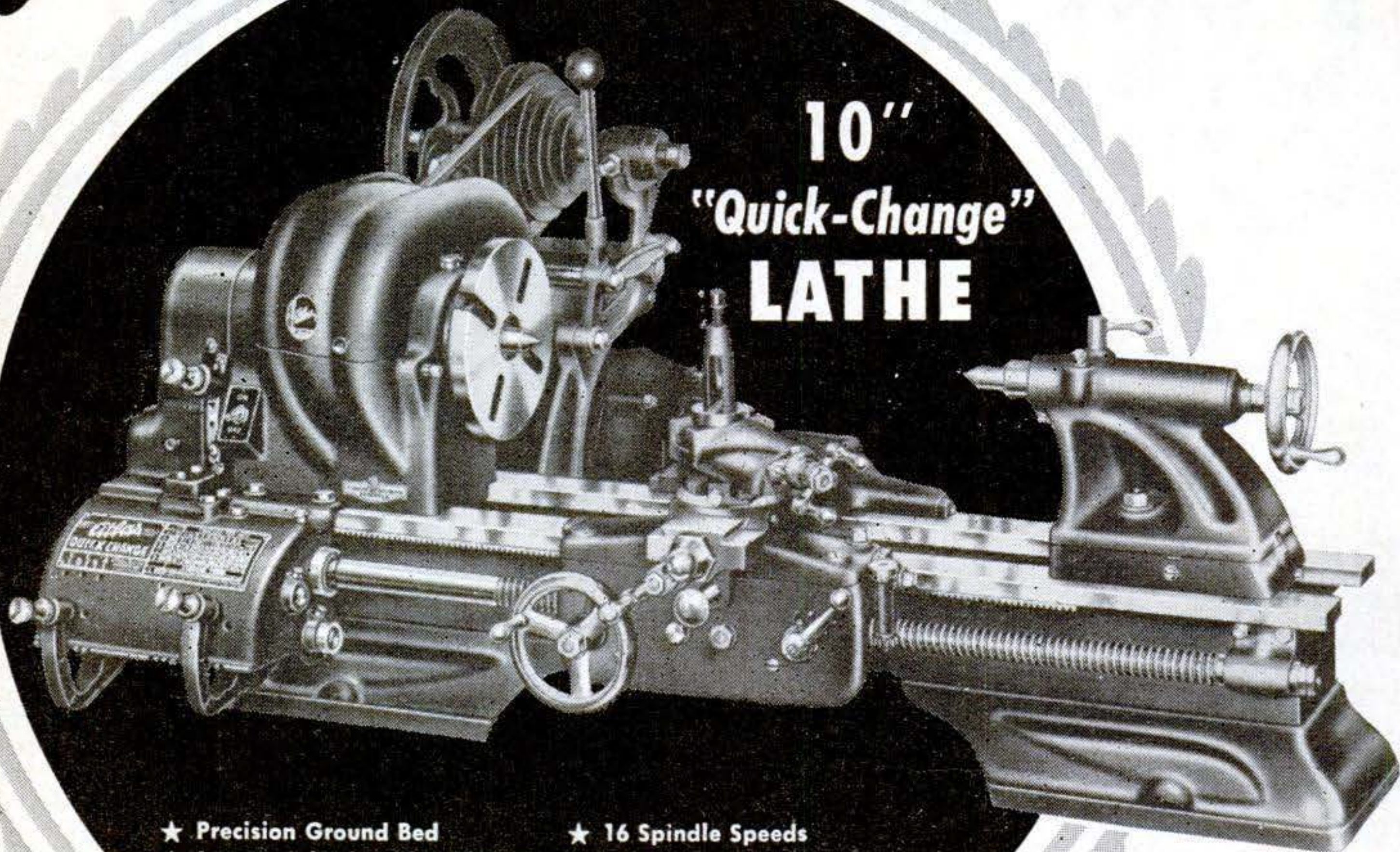


ROCHESTER 4, N. Y.

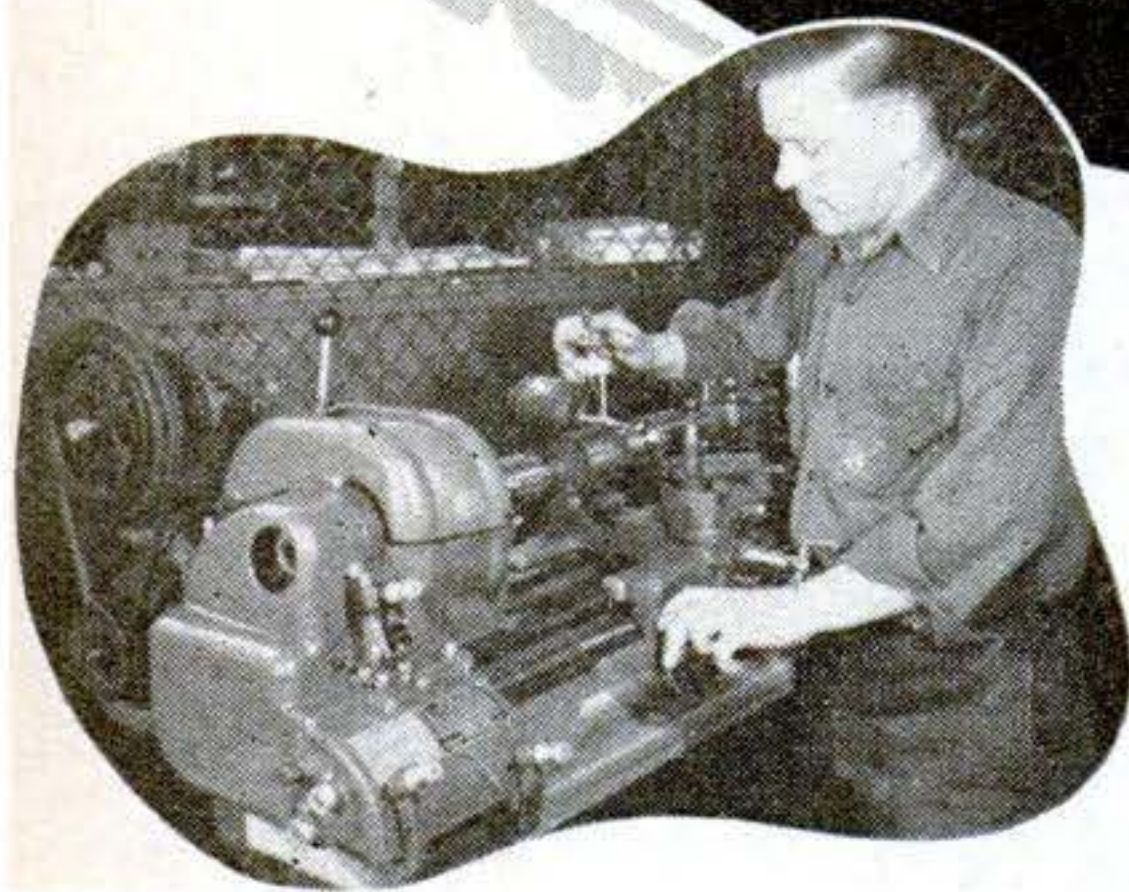
Kodak

Atlas

10" "Quick-Change" LATHE



- ★ Precision Ground Bed
- ★ Instant Selection of 54 threads or feeds
- ★ Instantly Reversible Power Cross and Longitudinal Feeds
- ★ 16 Spindle Speeds
- ★ V-Belt Drive
- ★ Back Gears for Extra Power
- ★ Timken Tapered Roller Bearings



Atlas 10" Lathes with standard change gears, and Atlas 6" Metalworking Lathes also available.

Best Buy For Your Metalworking Shop

Thousands of commercial and home shop owners from coast to coast confirm this fact — America's greatest compact metalworking lathe value today is the Atlas 10" "Quick-Change" lathe. Your own comparison — feature by feature — quickly shows you why. In *speed range, bearings, versatility, dependable lasting precision, and economical price* — it has no equal!

Atlas Timken tapered roller bearings enable you to do wood-turning, metal spinning, and plastics machining as well as work at normal speeds. An Atlas gives you precision to ten thousandths on standard machining jobs . . . saves you time and money in home or commercial shop, garage, or industrial plant. Ask your Atlas distributor for full details, or send for the new free catalog.

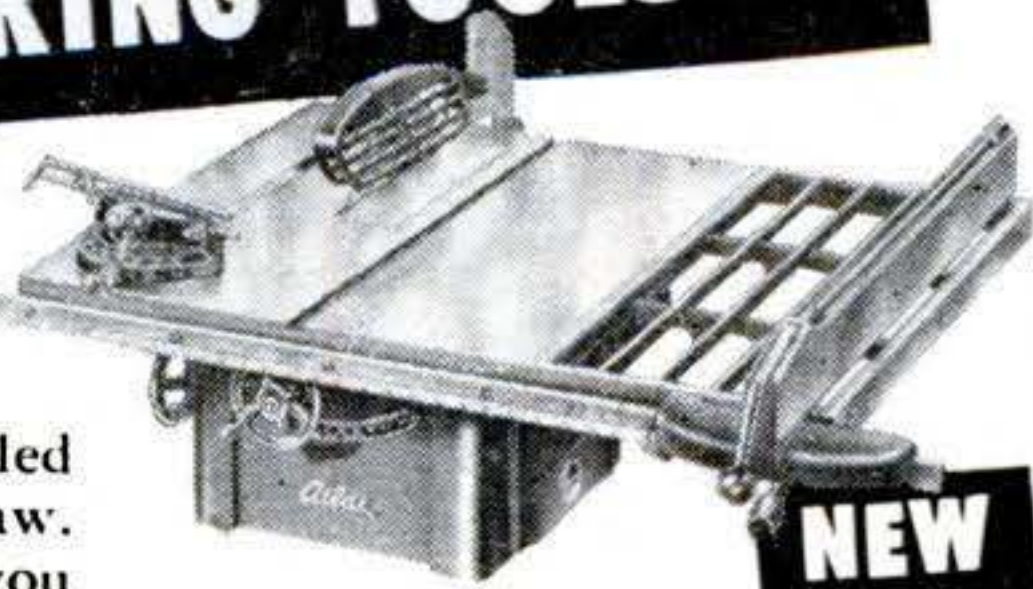


MATCHED PRECISION TOOLS

NEW *Atlas* BIG-CAPACITY WOODWORKING TOOLS

10" TILT/ARBOR BENCH SAW

Now any-size project can be handled in your shop with this big new saw. No. 3070 (one extension) gives you capacity for ripping 4' panels between blade and fence, 12 $\frac{3}{4}$ " table surface ahead of blade. Cuts 3 $\frac{1}{4}$ " deep. Precision-ground grey-iron table. SKF ball bearings.



NEW

24" JIG SAW

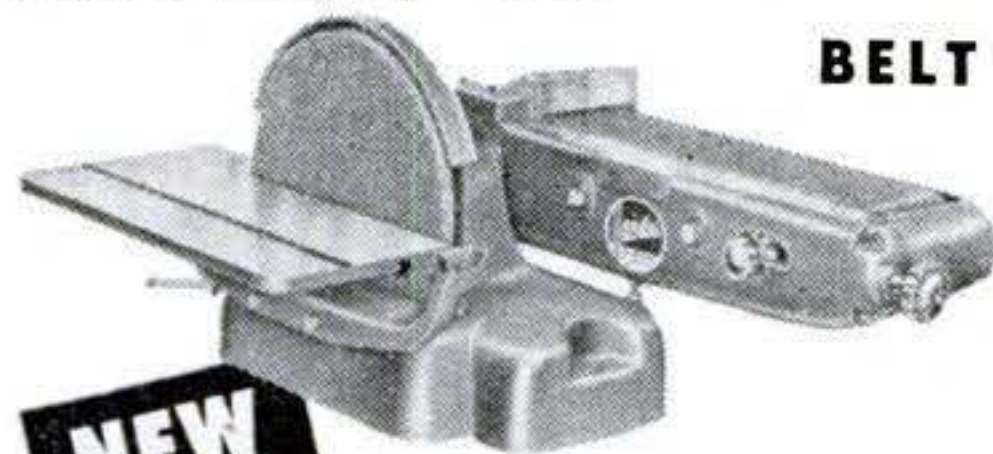
The 14" x 14" table gives you an idea of its massiveness. 4 speeds. Cuts 2 $\frac{1}{4}$ ". Chuck takes blades and sabres to 5/16" wide, files to 1/4" shank. Table tilts 45° R, 15° L. SKF ball bearings.



NEW

WOOD SHAPER

The real aid to "professional" workmanship — panels, reeds, flutes, grooves, bevels, planes, tongues, etc. Has 15" x 21" table which raises and lowers 2". Stationary spindle on SKF ball bearings for lasting accuracy, smooth cutting. Takes all cutters with 1/2" bore.

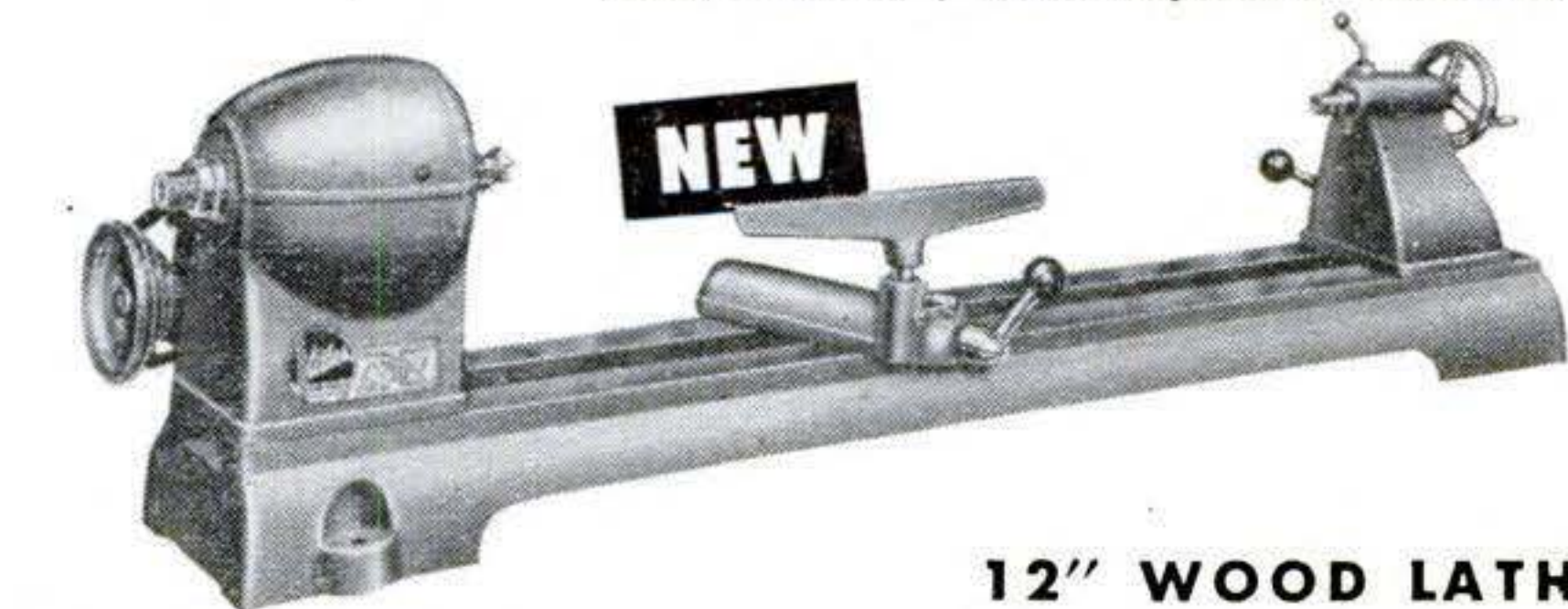


NEW

BELT and DISC SANDER

Takes all the hard work, and inaccuracy, out of hand sanding. Gives you a "professional" finish in a matter of seconds. 10" diam. disc, 4" wide belt sand any width

boards, angles, curves — metals, plastics. Table tilts 45°, both ways. SKF ball bearings.



NEW

12" WOOD LATHE

The last word in a smooth, dependable wood lathe for your shop. It's built with extra-heavy bed, head, and tailstock. Has 12" tool rest. Both tailstock and tool rest have instant lock-levers for quick positioning. No wrenches needed. Handles outboard and inboard turning. SKF ball bearings plus many other new and useful features. Be sure to see it.

Send
Postcard
FOR LATEST CATALOG

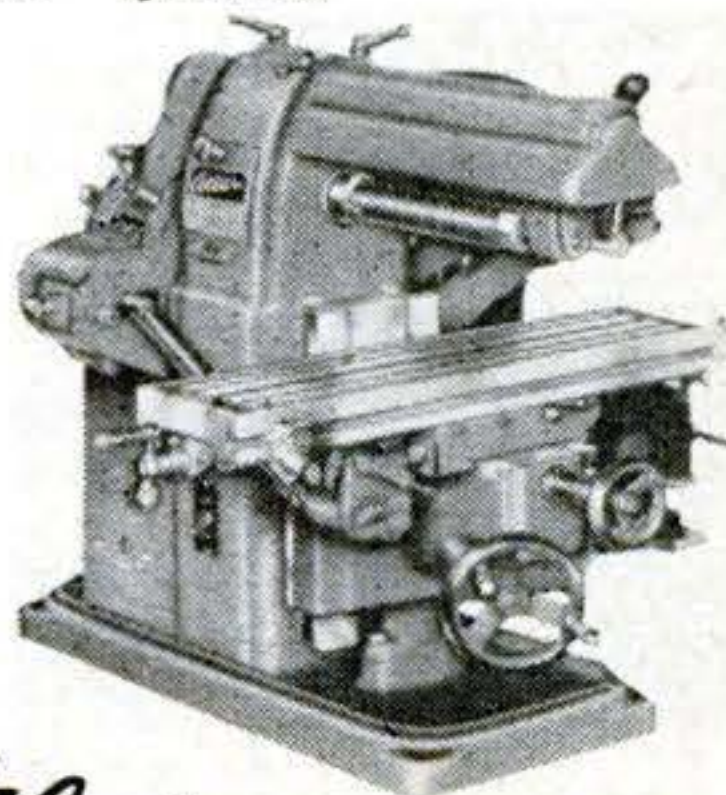
FOR METALWORKING AND WOODWORKING

To Complete Your Metalworking Shop

Atlas

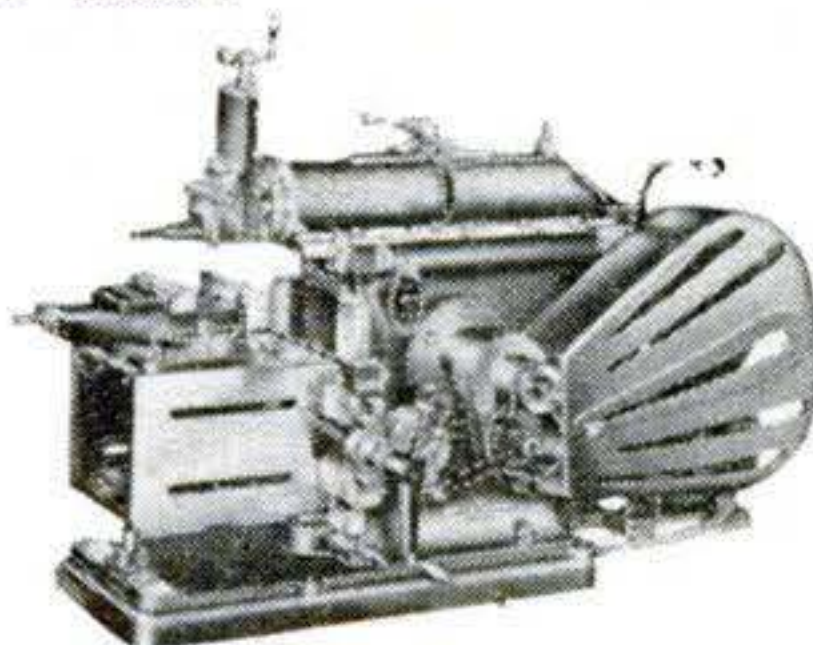
DRILL PRESSES

For pleasure or profit, or both, you can't beat an Atlas drill press for fast accurate drilling and tapping. And with low cost attachments it mortises, routs, sands, carves, shapes. 7 TOOLS IN 1. Bench and floor sizes take drills to 1/2". Exclusive "floating-drive" spindles.



Atlas MILLING MACHINE

Gives you the full range of milling operations — slabbing and facing cuts, end milling, keyways, boring, layout work. Timken bearings. 8 spindle speeds. Operates from 1/2 HP motor.



Atlas 7" SHAPER

Handles all shaping operations within a 7" stroke — dovetailing, keyseating, vertical and angular cuts, gear cutting. Heavily built. Crank type ram drive. Timken bearings. 4 speeds. 5 cross feeds. See catalog for full details.

ATLAS PRESS Company

1155 N. Pitcher St.,
Kalamazoo, Mich.

"GRANDAD" KNOWS HIS FILES



He's been using them for years. And, as long as he can remember, they've been Nicholson or Black Diamond files*. For, like every other old-timer—and a good many young craftsmen, too—he takes pride in working with fine tools.

He knows, for example, that Nicholson and Black Diamond quality pays off in faster filing, better work, longer lasting service. What's more, he knows the importance of using exactly *The right file for the job*. That's why he keeps a good assortment of kinds, cuts and sizes. No telling what kind of fix-it-please job those kids will bring in next.

Your hardware dealer will be glad to help you make up an all-purpose set of Nicholson or Black Diamond files. See him about it!

*Nicholson has been making good files for three generations. Write for your free copy of "File Philosophy" — an interesting, 48-page book on the kinds, care and use of files.



NICHOLSON FILE CO.
19 Acorn St., Providence 1, R. I.
(In Canada, Port Hope, Ont.)



NICHOLSON FILES

FOR EVERY PURPOSE

- Test ALL Home Outlets
- Find Open Circuits

STAR TEST-PLIERS

- Locate Blown Fuses
- Remove Fuses SAFELY

A must tool for electricians, maintenance men, home owners. Replaceable lamp inside Plier tests 110 to 250 Volts. Plier pulls fuses from 10 to 100 Amperes. Shockproof. Requires the use of only one hand. Can be obtained from General Electric or Westinghouse stores, local electric dealers or direct from us, postpaid.

A Useful Xmas Gift

Price \$2.75 without Leads, \$1 50 additional for Leads. Order TODAY. **STAR FUSE CO., 237 Canal St., New York 13, N. Y.**

CARBIDE SCRIBER

NON-MAGNETIC

Tungsten Carbide — carefully ground on diamond laps, brazed into stainless steel 6" handle for marking steel and other metals — for etching, marking, cutting glass. In plastic case with pocket clip.

\$2.00
PRICE POST PAID

PRICK PUNCH

Tungsten carbide tip, silver brazed into 3 1/2" heat treated steel body.

with Carbide Tip.... **\$1.50**
Price Post Paid

LUCAS-MILHAUT ENGINEERING CO.
5051 SOUTH LAKE DRIVE • CUDAHY, WISCONSIN

New Designs in FRANZITE GRIPS

Modernize Your Gun! Improve Your Score!

Most durable grips made. Positively unbreakable! For Colt, Smith & Wesson, Hi-Standard, Ortgies, Luger & Mausers in a wide choice of beautiful designs in ivory, pearl, walnut, onyx, etc. Low prices. FREE CATALOG. Dealers Wanted.

SPORTS, INC., (Mfrs.) 5501 Broadway, Dept. S-11, Chicago 40, Ill.

WRITE NOW FOR FREE CATALOG NO. S-0

POWER TOOLS

FOSTER MFG. CO., 1 KINSEY AVE., BUFFALO 17, N. Y.

DOUGLASS Steel-Pack MUFFLERS

For All Makes and Models

ORDER NOW! Performance that excels • Stamina that endures
Rugged construction. Steel tubing. Straight-thru-design. Solid tube with steel packing. "Throbbing Deep Tone."

Complete for Easy Installation

32-40 FORD V-8	\$5.96	29-48 CHEVROLET	\$5.96
41-49 FORD V-8	6.85	31-41 PLYMOUTH	5.96
39-49 MERCURY	6.85	42-48 PLYMOUTH	6.85
35-48 FORD & MERCURY DUAL SETS			\$23.00
49 FORD & MERCURY DUAL SETS			25.00

Specify Year and model • Satisfaction Guaranteed. Enclose Money Order or Check With Order. Send for Full Price List.

RACING EQUIPMENT CO. Dept. PS-11
1916 W. Valley Alhambra, Calif.



Coming your way -
SUPER-SMOOTH RIDING!

1949 HARLEY-DAVIDSON with the new *HYDRA-GLIDE* FORK!

NEW "flight-smooth" comfort that irons out bumps like magic!

NEW "road-hug" stability that makes handling easy and sure!

NEW "effortless" steering that gives positive control at all speeds!

NEW "feather-touch" braking that provides stopping power to spare!

NEW "speed look" that makes people stop, look, and *envy*!

NEW unmatched performance for greatest fun and thrills!

You'll think you've got wings . . . when you take off down the highway on this jet-like streamliner! It's so smooth, so comfortable! It handles so easily, hugs the highway so securely, stops so quickly! Amazing Hydra-Glide Fork irons out bumps like magic, gives you effortless steering ease, new riding stability even on roughest roads. Faster-action, oversize front brake gives you increased stopping power. Sealed ray headlight makes night riding a pleasure. These and other features of the 1949 Harley-Davidson bring you new thrills, more fun, more enjoyment than ever before as you take in race meets, hillclimbs, endurance runs, gypsy tours, sightseeing trips. See your dealer today and mail the coupon now.

HARLEY-DAVIDSON MOTOR CO., Dept. PS, Milwaukee 1, Wis.

Send literature on 1949 models, also free copy of *ENTHUSIAST* Magazine filled with motorcycle action pictures and stories.

Name.....

Address.....

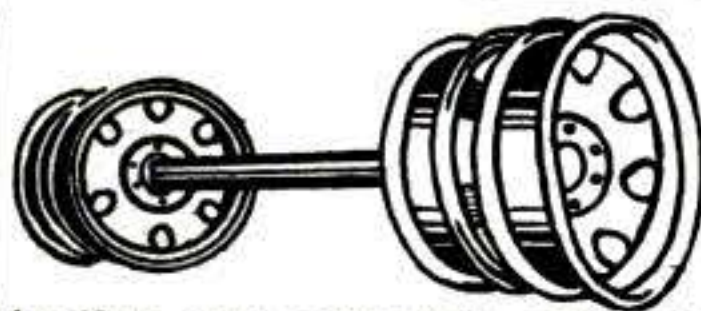
City..... State.....

Copyright 1948, Harley-Davidson Motor Co.

Thousands of Parts
For Military

TRUCKS

We have for immediate delivery genuine parts for all makes and models, 4x2 - 4x4 - 6x4 and 6x6. All models from 1/4 ton to 20 tons. All makes: Autocar, Biederman, Brockway, Chevrolet, Diamond T, Dodge, Federal, Ford, GMC, International, Mack, Oshkosh, Reo, Studebaker, White, Willys, and Jeeps. We have parts lists available on most models. Write stating model of Truck.



TRAILER AXLE

Heavy duty trailer axle suitable for many types of trailer construction. Also excellent for building of heavy farm trailers and wagons. It is a 15,000 lb. capacity square type straight

trailer axle complete with Timken roller bearings, hubs, and 6 hole 750 x 20 Budd Wheels. Without brakes. Axle is 2 1/2 inches square and 70 inches between wheel mounting flanges. Std. width. AN EXCELLENT BUY.

With Single Wheels \$59.50 With Dual Wheels \$69.50

New All Purpose WINCH

3,000 Lbs. Rated Capacity

Ideal For Jeep



Spur gear type winch complete with crank, 50 ft. 1/4 inch cable and hook and 89 inch boom with pulley. Ideal for lifting or pulling. Winch bracket can be mounted on truck or at material location. Plenty of power, 27 to 1 ratio. Weight of entire unit unpacked 142 lbs., boxed 238 lbs. Special, each...

\$59.50

WINCH CABLE—
With Chain and Hook.
1/2" in diameter. 200
ft. length. **\$25.00**
New.....

AUSTIN PINTLE HOOKS—
For All Trucks and Trailers. 25,000 lbs.
capacity, shipping wght. 30 lbs. List price
\$47.50. Single ea. only \$8.95. **\$7.50**
Lots of 12, each only.....

All prices quoted are FOB, Kansas City.
25% deposit required on COD orders.



UNITED AUTO PARTS CO., INC.
1901 TROOST GR. 1800 KANSAS CITY, MO.

Say You Saw

It In Popular Science

BUILD and ENJOY YOUR OWN BOAT!

ASSEMBLED IN
8 HOURS

WITH A
Plywood Boat Kit

LIGHTWEIGHT, 12 FEET LONG.

READY CUT—needs no forms nor special tools to assemble. Kit includes all hardware, paint, etc. (less oars). Send for Free Folder.

TAFT MARINE WOODCRAFT

Dept. N, 636 39th Ave. N.E., Minneapolis 18, Minn.

ONLY \$54.00
Freight paid

Do a Better Job WITH ONE OF THESE EMPIRE LEVELS

Smallest, most
handy and accurate
Level made. "Cigar-
shaped"—no sharp
corners to tear pocket. Aluminum stock. Only 3 oz. wgt.
9" long. Has Level, Plumb, 45° Vials.

EMPIRE TORPEDO LEVEL



No. 26\$2.00



ALUMINUM LEVEL — No. 151

Cast and Machined, a Beautiful Tool, with Patented, Removable Level and Vial.

With 2 Plumb, 2 Levels, 2 — 45° Vials. 18".....\$6.00
24".....\$6.50 28".....\$7.00

Order EMPIRE LEVELS from your local dealer.
Write direct for literature.

EMPIRE LEVEL MFG. CO.

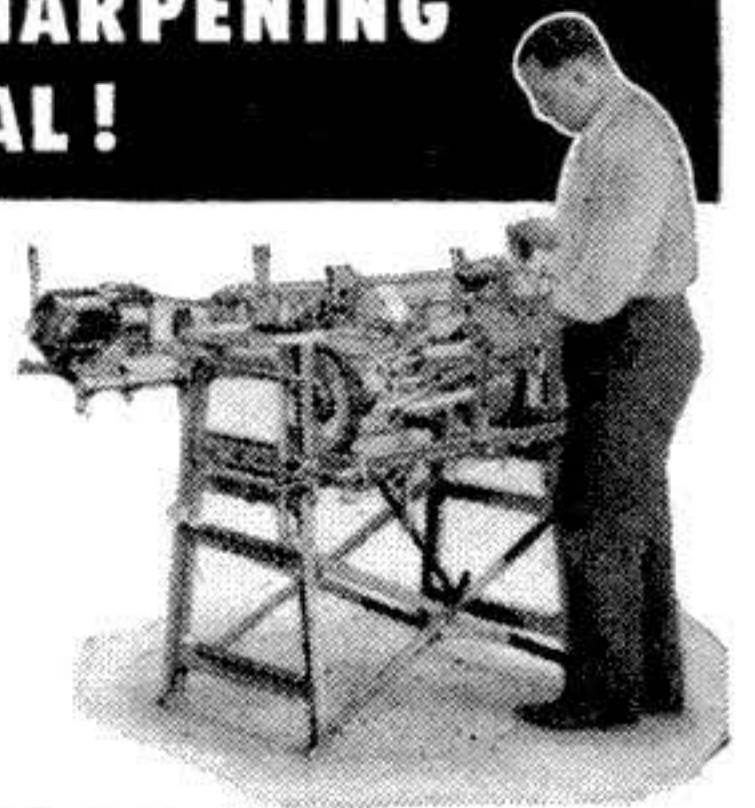
Box 97, Dept. 707 • Milwaukee 13, Wis.

LAWNMOWER SHARPENING IS NOT SEASONAL!

WITH THE PEERLESS GRINDER!

Golf clubs, parks, and cemeteries are now ready to turn over their mowing equipment for overhaul. With a PEERLESS GRINDER you cash in on this year 'round business. Earn extra money!

SEND FOR FREE CATALOG



The FATE-ROOT-HEATH CO.

DEPT. D-4 • PLYMOUTH, OHIO

CONVENIENT • DEPENDABLE



Gasoline Protection

Manufacturers Representatives:

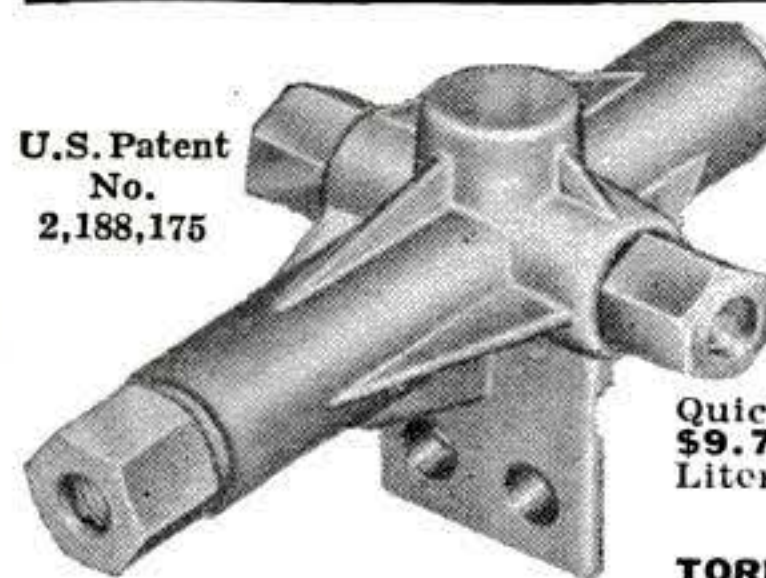
Best accessory news of the year, FEN'DOR'LOK, protection against gasoline theft, operating from the dashboard of the car. (Not connected to gasoline filler pipe.) Send today for catalog sheet.

FEN'DOR'LOK

Electric lock for fender door
Steele Mfg. Co. 445 Winchester Ave.
Ashland, Ky.

VAPOR INJECTION gives SUPER POWER

U.S. Patent
No.
2,188,175



VAPOJET gives your car super aircraft power & performance. This amazing new water and oil injector gives 25% more gas mileage on regular gas. A double saving! Removes carbon, prevents vaporlock and overheating. Quick easy installation. Order today! \$9.75 Complete. Give No. of cyl. Free Literature on request.

VAPOJET MFG. CO. Box 95
Bay Cities Airport
Torrance California



LAWN ORNAMENT-NOVELTY PATTERNS

28 Lawn Ornament Patterns, 25c. Other patterns: 15-20" high; Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 10c each. 25 Novelty Patterns, 30c. All 62 Full Size Patterns, \$1.00 Postpaid.

FLYING DUCK

Wind revolves wings. Realistic appearance. Pattern, Instructions and wing Pinion Kit; brass bearing, steel shaft, wing lugs, bolts, nuts and washers, 50c. Pattern only, 25c. Postpaid.



STROTHER PATTERN SERVICE
Dept. 7AM Box 383 Belington, W. Va.

5 TOOLS

for the price of one!



New
PORTER-CABLE
DISC
GRINDER

Price
Only \$44.50

Grinds, polishes, sands, drills, cuts

Actually no other grinder of the same type compares with the new Porter-Cable Disc Grinder. No other grinder offers the same features. No other grinder is so rugged . . . or so versatile!

ONLY the Porter-Cable Disc Grinder has ALL these advantages!

1. The Porter-Cable Disc Grinder sands old and new woodwork . . . grinds down metals . . . operates on flat and curved surfaces . . . polishes your car, furniture, brass and other metals . . . drills . . . mixes paint . . . does 101 jobs in less time with less work . . . and with more profit.
2. The disc on the Porter-Cable Grinder is 6 inches in diameter . . . cuts 53% larger surface than ordinary machines. Grinds any material—wood, steel, plastic, glass.
3. Its rugged motor is twice as powerful—a reserve protection from overloading.

4. Shaft is extra heavy: $\frac{5}{8}$ inches diameter.
5. Chuck for drills, wire brushes, cut off discs and many other accessories.
6. Spindle has a high-load bearing to take the heavy stress and end-thrust of drilling and tough grinding.
7. Trigger-lock switch avoids fatigue.
8. Porter-Cable Disc Grinder stands up longer . . . holds sustained speed . . . lasts indefinitely.

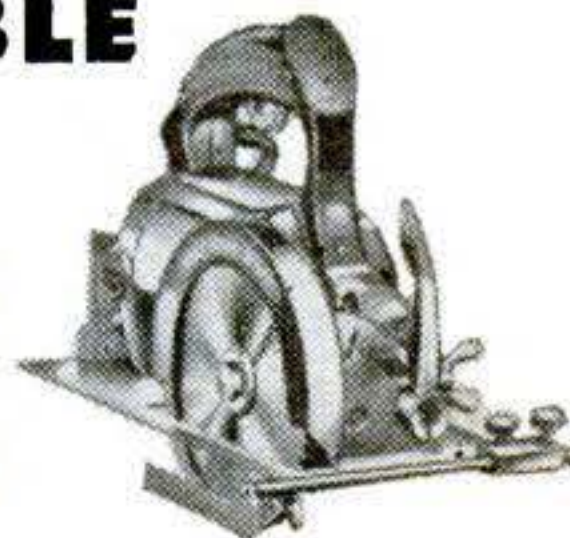
Guaranteed for one year against imperfections in materials and workmanship

See the Porter-Cable Disc Grinder. Try it. Compare. And you'll agree that no other machine gives you as much for your money! At hardware, lumber and mill supply dealers everywhere. Nearest dealer's name furnished on request.

PORTER-CABLE
SAWS • SANDERS • GRINDERS
PORTER-CABLE
MACHINE CO.
PORTABLE ELECTRIC TOOLS
1902-11 N. Salina St.
Syracuse, N. Y.

EASIER SAWING
5 TO 10 TIMES FASTER
PORTER-CABLE
GUILD SAW

Weights only 6 $\frac{3}{4}$ lbs. for easy one-hand operation. Blade lowers and raises for cuts from scratch to 1 $\frac{1}{4}$ inches deep . . . tilts for bevels up to 45°. Does anything a hand-saw will do, and more! Price only \$49.50



MAKERS OF INDUSTRIAL TOOLS FOR OVER 40 YEARS

GIFT OF THE YEAR

for a photographer

the meter with a
MEMORY!

the new



exposure

METER

Versatile! Complete. Good for movies and stills, incident or reflected light. And so easy to use! Give the new G-E photographic exposure meter for a thrilling Christmas! Type PR-1, \$32.50*. General Electric, Schenectady 5, New York.



Also famous Type DW-58 . . . \$19.95* and \$21.95*.

*Fair Trade price. Fed. tax inc.

GENERAL ELECTRIC

606-47K



FOR TRAINED MEN

in the uncrowded field of
WOOD PRODUCTION ENGINEERING

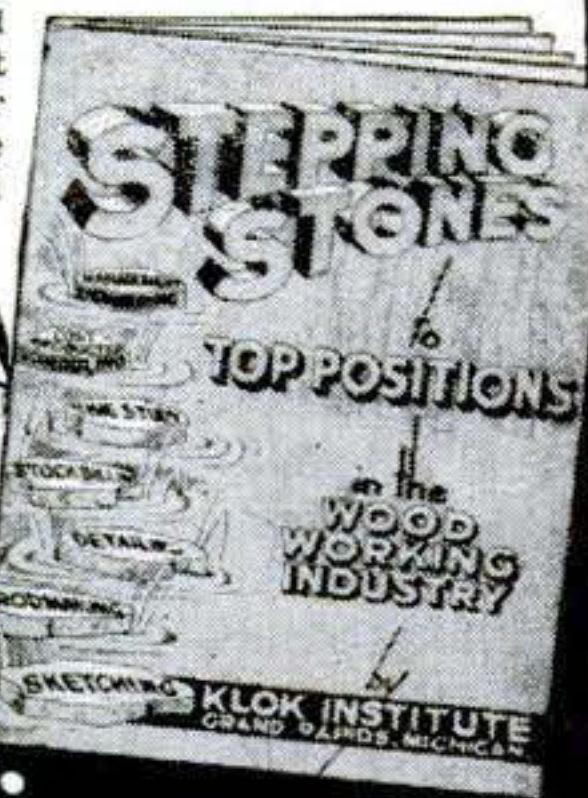
The steps to top positions in the wood working industry, through resident study and training in Grand Rapids, or correspondence home study course are all described when you Write Now and

GET THIS FREE BOOK

Veterans make wood working your vocation. You can study and train FREE under G.I. Bill. State preference for resident or correspondence course, with Name, Age, occupation, and if veteran. Write now to

KLOK INSTITUTE

PENINSULAR BLDG.
GRAND RAPIDS 2, MICH.



HARGRAVE

I-BAR CLAMP

Patented

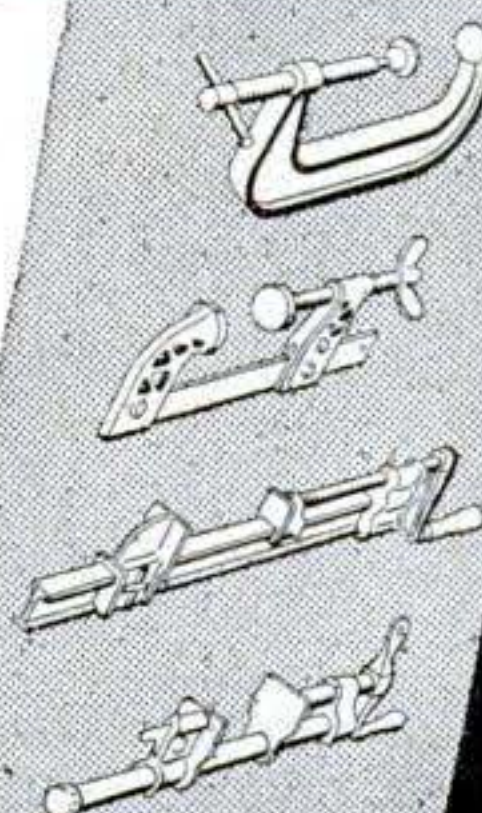


The Hargrave "I" Bar Clamp—the favorite of craftsmen everywhere—is designed for the hard, everyday grind of production. Web notches permit quick action, no slipping. Heat treated steel screw. Openings from 2 feet to 10 feet.

At Hardware and Mill
Supply Dealers Everywhere.

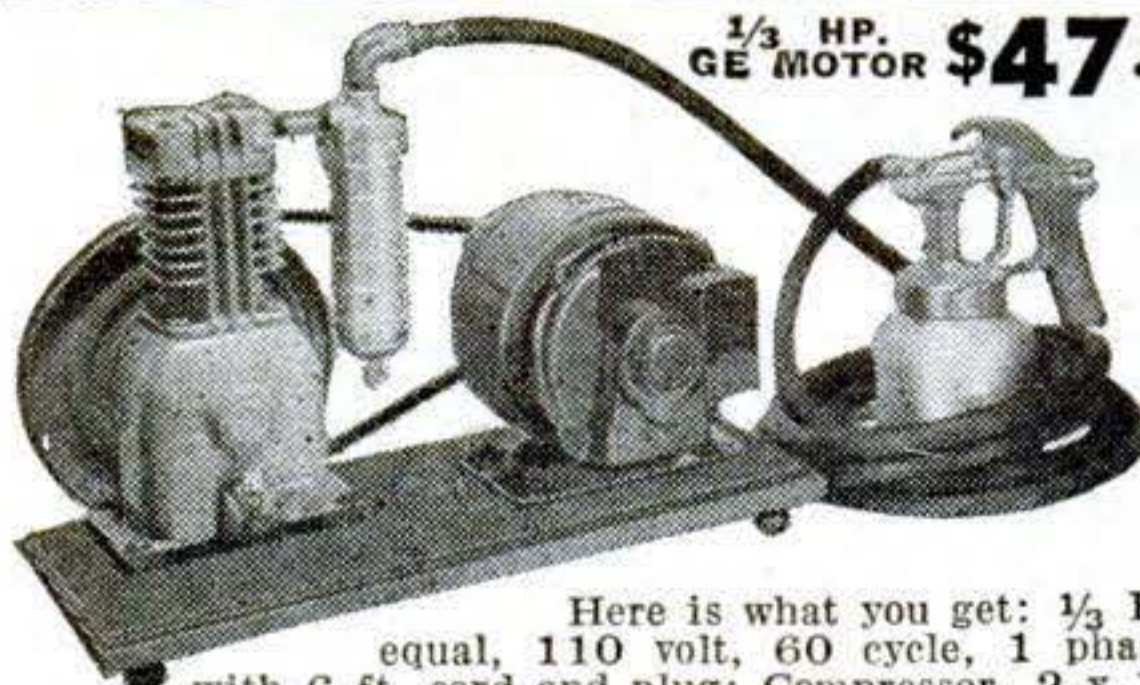
Write for Catalog of
Complete line.

1955 Waverly Ave.
Cincinnati 12, Ohio



The CINCINNATI TOOL Co.

SPRAY PAINTING OUTFIT



1/3 HP. GE MOTOR \$47.50 COMPLETE LESS BASE

2.8 C. F. M.
Displacement
Compact
Power Plus

Complete as
shown,
less base

Here is what you get: 1/3 HP. GE motor or equal, 110 volt, 60 cycle, 1 phase, 1750 RPM, with 6 ft. cord and plug; Compressor, 2 x 1 3/4 piston type; Spray gun with qt. cup, 2 nozzles, round-fan spray, oil and water trap, 20 ft. hose and fittings; belt and pulley. All bolts necessary for mounting on base. We pass the big saving in labor on to you. All you have to do is mount on base as shown. Complete operating instructions furnished. Weight 50 lbs. Special Price.....

\$47.50

ALSO SOLD SEPARATELY:

Spray Gun, 2 nozzles, 20 ft. hose, weight 6 lbs. \$ 9.45
Air Compressor with oil and water trap, weight 15 lbs. 19.95
1/3 H.P. G.E. Motor, weight 26 lbs. 14.50

PRICES ARE F.O.B. CHICAGO. Immediate delivery. SOLD ON MONEY BACK GUARANTEE. Send check or money order today. WRITE FOR FREE FOLDER.

C & M EQUIPMENT COMPANY 1831 S. State St., Dept. B-11, Chicago 16, Ill.

MAKE YOUR STOP LIGHT SHOUT



AMAZING STOP LIGHT FLASHER

Makes Your Stop Light Flash 115 Times Per Min.

A SENSATION! Automatic, instant acting when foot brake applied. Non-rusting, Dust, Oil, Vapor & Waterproof. Used by Police & Fire Depts. Attach in 5 min. to any model car or truck. Approved by safety engineers. FREE BOOKLET with order. Tells how to SAVE MONEY ON YOUR CAR. ORDER NOW if dealer can't supply. SEND NO MONEY. Pay postman \$3.00 plus postage. Send \$3.00 we pay postage. Satisfaction or money back.

Dealers & Agents Wanted

MACCHI & CO., 927 Larkin St., Dept. SN, San Francisco, Calif.



\$6.95

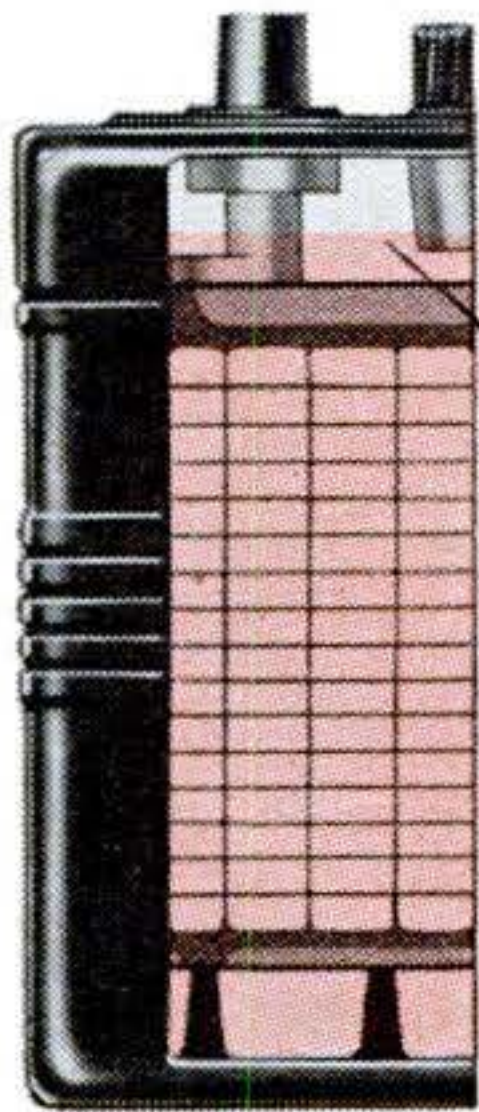
SHARPEN CIRCULAR SAWS LIKE AN EXPERT

With SURE-SHARP you can precision file your own saws for the home workshop. No experience necessary. Adjustable for any pitch or angle. Makes blades true and sharp. Complete with file and instructions. Money back guarantee. Cash with order, prepaid. Order Now!

SURE-SHARP MFG.CO. BOX 24, SANTA ANA 2 CALIFORNIA

Here's Why New AUTO-LITE STA-FUL Battery

*...needs water
only 3 times a year**

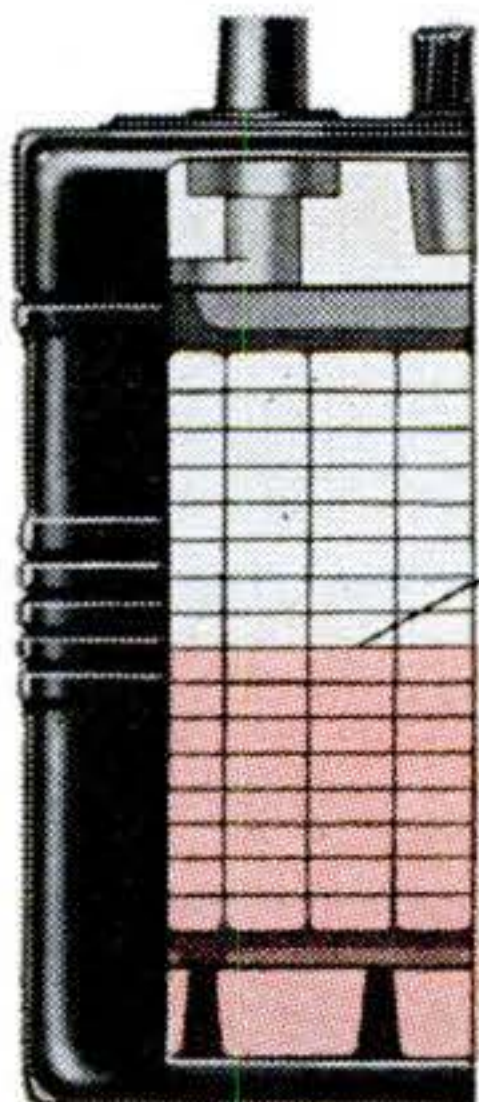


ORDINARY BATTERY



HERE'S WHAT HAPPENS INSIDE AN ORDINARY BATTERY

This battery is now full. Small liquid reserve gives battery plates little protection against damage and loss of power if evaporation lowers liquid level.



ORDINARY BATTERY

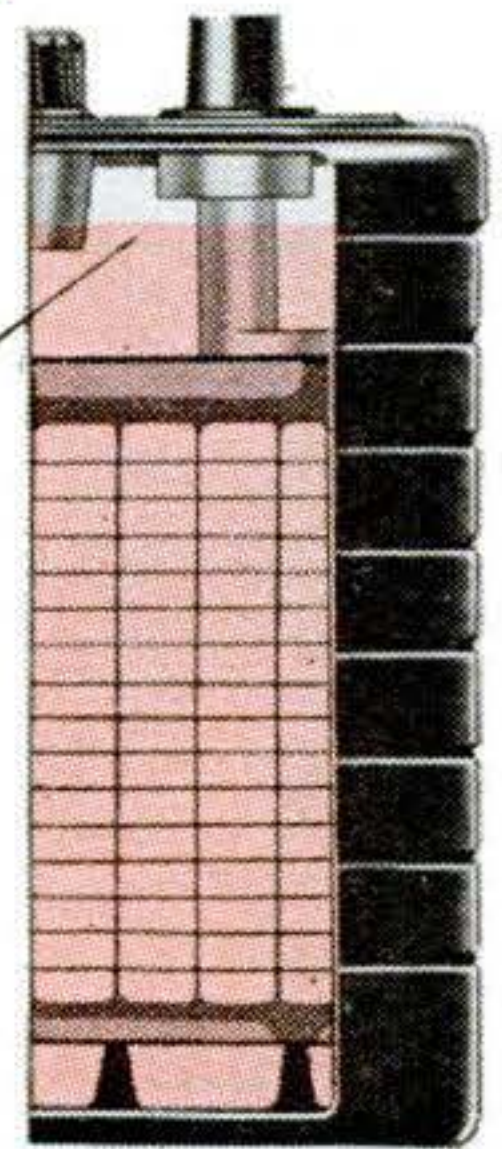


Equal Liquid Loss From Both Batteries

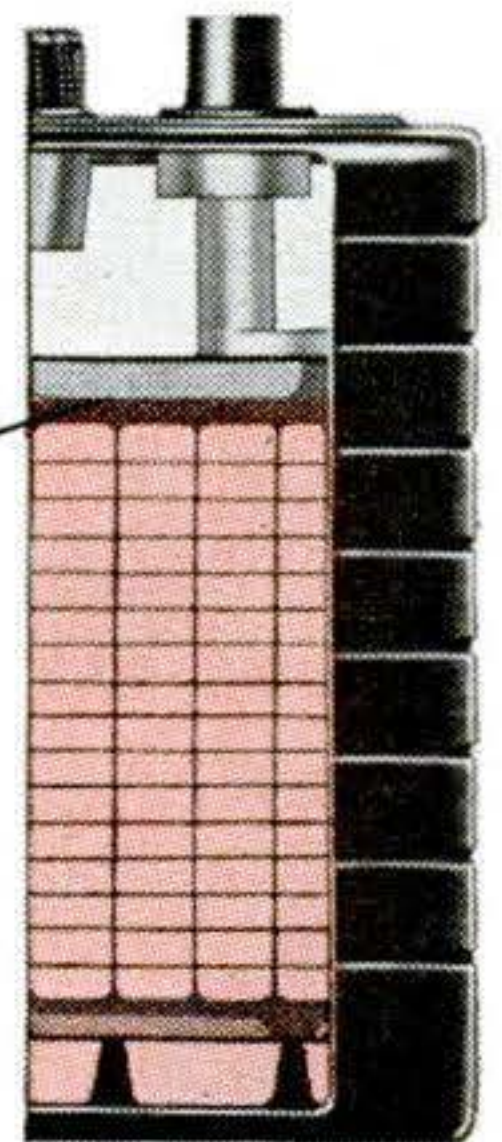
Plates at the left are now exposed and inactive because of the small liquid reserve provided in ORDINARY battery.

HERE'S WHAT HAPPENS INSIDE AUTO-LITE "STA-FUL"

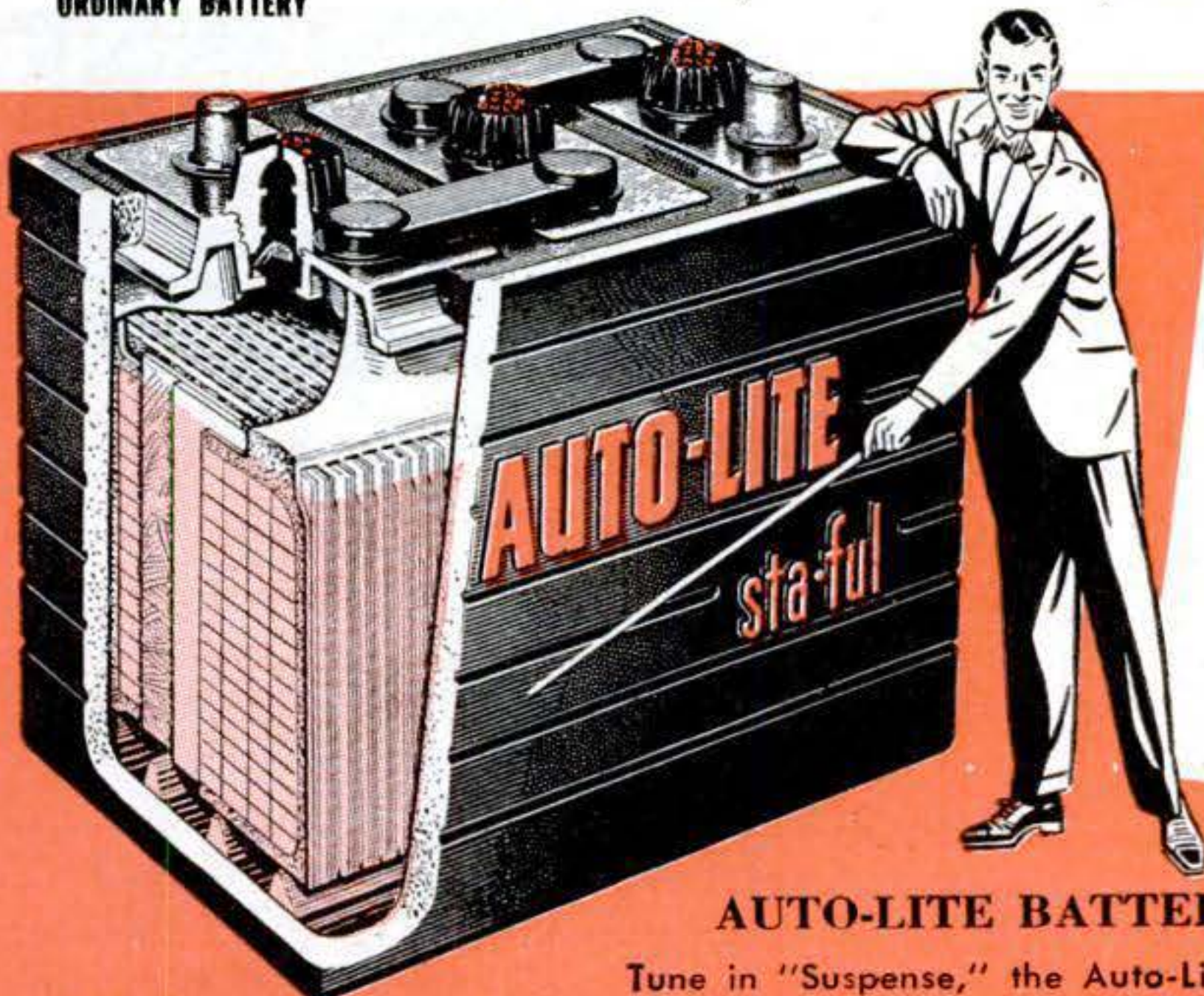
The new "Sta-ful" has more than 3 times the liquid reserve of ordinary batteries. Gives its plates added protection. Battery lasts longer too!



STA-FUL BATTERY



STA-FUL BATTERY



Why the "Sta-ful" Design Is Possible
Fibre-glass mats help to keep the power-producing material from shedding—add to battery life. This makes possible the "Sta-ful" construction with its smaller sediment well which permits room for a liquid reservoir with over 3 times the usual capacity at the top of the battery. Make your next battery an Auto-Lite "Sta-ful."

AUTO-LITE BATTERY CORPORATION, Toledo 1, Ohio

Tune in "Suspense," the Auto-Lite Radio Show—Thursdays, 9:00 P.M.—E.T. on CBS

*In normal car use

WHAT A CHRISTMAS GIFT!

NOW...SANDING IS FUN!



Patented

Amazing MOTO-SANDER AND POLISHER

Saves Time—Saves Elbow Grease!

Here's an inexpensive Sander and Polisher so easy to handle that a child can use it. All you do is guide it! **Moto-Sander** delivers 7,200 strokes a minute . . . does a magically smooth job . . . gets into places other sanders can't reach. Has only two moving parts . . . never needs oiling or adjustment. Uses 110-120 volt, 60 cycle A.C. electric current. Has 8 ft. (Underwriters' Approved) rubber cord. Furnished with 6 sheets assorted grade Garnet paper for sanding, plus 1/8" thick felt pad and sheepskin pad for wax polishing.

Only
\$14.85

POSTPAID

FINE FINISHES—FAST!

Use **Moto-Sander** to get satin smooth sanded finish on woodwork, stairways, doors, furniture; ideal for finish sanding of boats, painted walls, bird houses or scale models. Use it also for speedy, effortless polishing of waxed furniture, automobiles and other surfaces, simply by removing sandpaper and clamping on polishing pad. **Moto-Sander** is the lightest, most practical electric sander on the market, and is patented.

MONEY-BACK GUARANTEE

See **Dremel Moto-Sander** at your dealer's. If he cannot supply you, use coupon below to order on 5-day trial, money-back guarantee. **Moto-Sander** will be sent complete and postpaid for \$14.85 (check or money order in full). Or, send only \$2 with order and pay postman balance plus postage upon C.O.D. delivery. Remember, **YOUR MONEY BACK** if not delighted after 5 days' trial.

DREMEL MFG. CO.

Dept. SP128-L Racine, Wis.
Manufacturers of the famous
MOTO-TOOL and **MOTO-SAW**



EASY FOR
AWKWARD PLACES



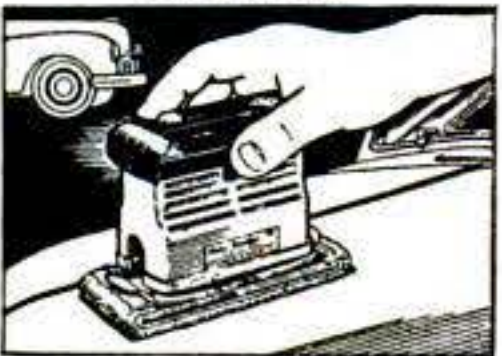
SANDS FLAT
SURFACES EVENLY



GETS INTO
TIGHT CORNERS



ROUNDS CORNERS
LIKE MAGIC

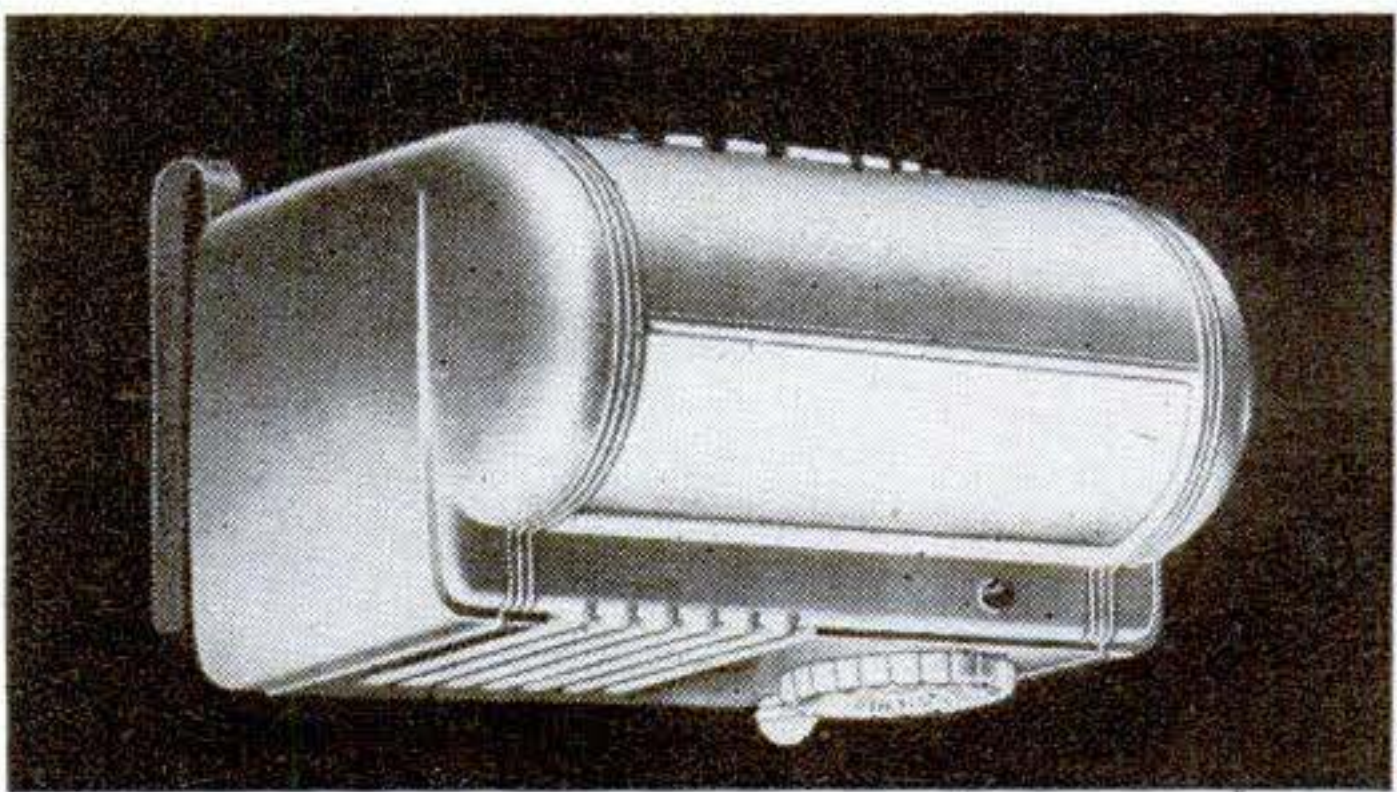


GREAT FOR
AUTO POLISHING



New Lamp Is Brighter

THIS new studio speedlamp, called the **Kodatron**®, is twice as powerful as the Eastman model it replaces. Its 1/5,000-sec. flash, almost as brilliant as sunlight, permits use of lens apertures as small as f/11 or f/16. Adjustments include reflector wings, to control the quantity of light on the subject, and a telescopic stand that can be extended up to 10 feet.



Lamp-Radio Fits Bed

LIKE to read in bed while listening to the radio? This combination bed lamp and radio, made to clip over the headboard, makes it easy to do both without cluttering up your bedside table. The four-tube super-het radio and tubular, nonglaring lamp operate separately or together on AC or DC. Made by Mitchell Mfg. Co., of Chicago, the unit measures only 9½ by 5½ by 7 in.

IF YOUR DEALER CANNOT SUPPLY YOU

USE THIS COUPON TO ORDER

DREMEL MFG. CO. • DEPT. SP128-L • RACINE, WIS.

- ☐ Enclosed find \$14.85 (Check or money order in full). Ship **Moto-Sander** at once Postpaid.
- ☐ Enclosed find \$2.00 as part payment on **Moto-Sander**. I will pay postman balance plus postage upon C.O.D. delivery.
- ☐ Please send Free Catalog of Dremel Tools and Equipment.

NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....



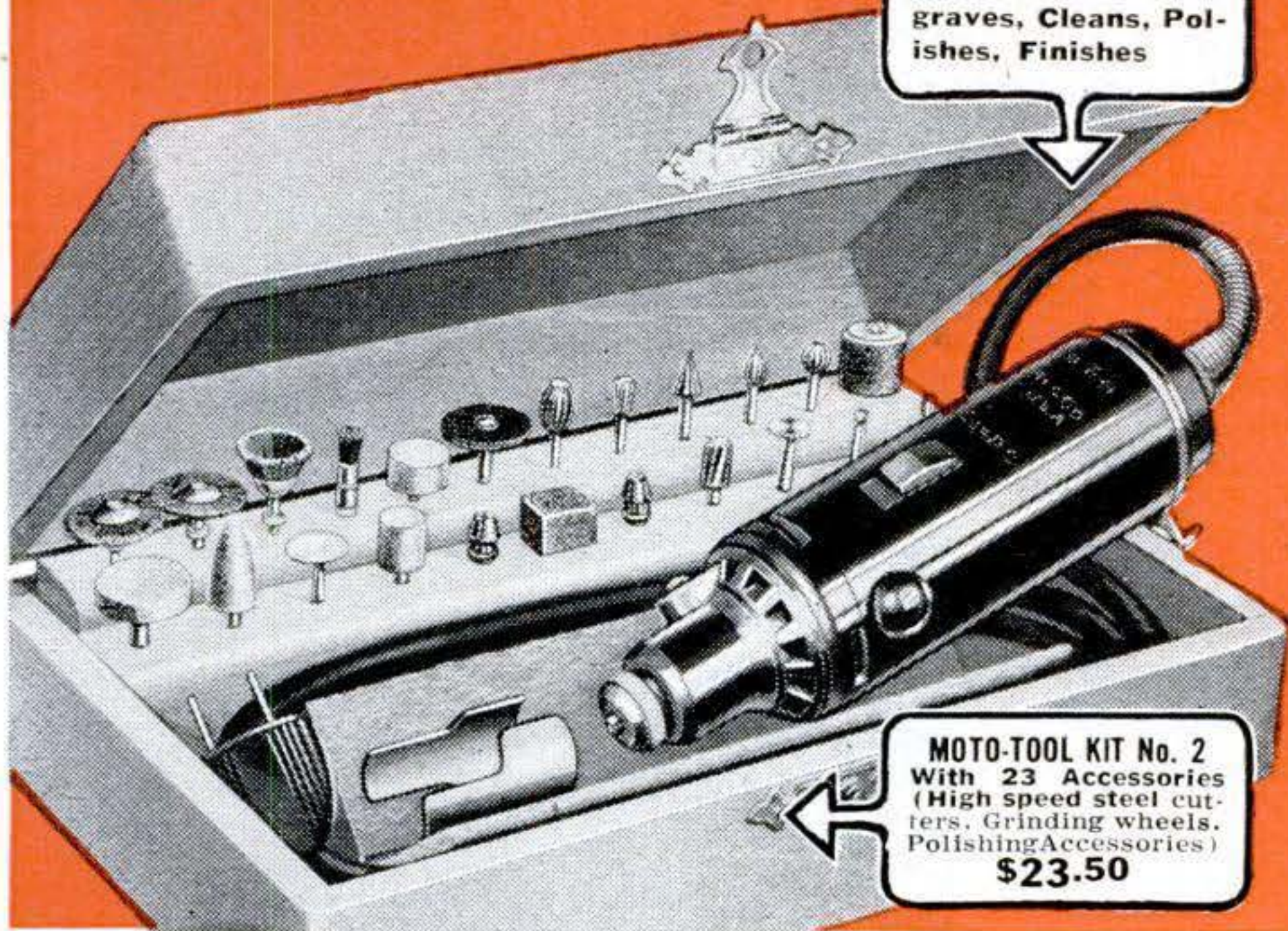
Moto-Tool

THE "POCKET-SIZE
MACHINE SHOP"

THE GIFT
HE'LL LIKE Best
AND USE
Longest



Grinds, Routes,
Drills, Carves, En-
graves, Cleans, Pol-
ishes, Finishes



MOTO-TOOL KIT No. 2
With 23 Accessories
(High speed steel cut-
ters, Grinding wheels,
Polishing Accessories)
\$23.50



APPROX.
27,000 R.P.M.



Great for
Hobbyists

Saves Time
and Labor

A SHOP TESTED TOOL

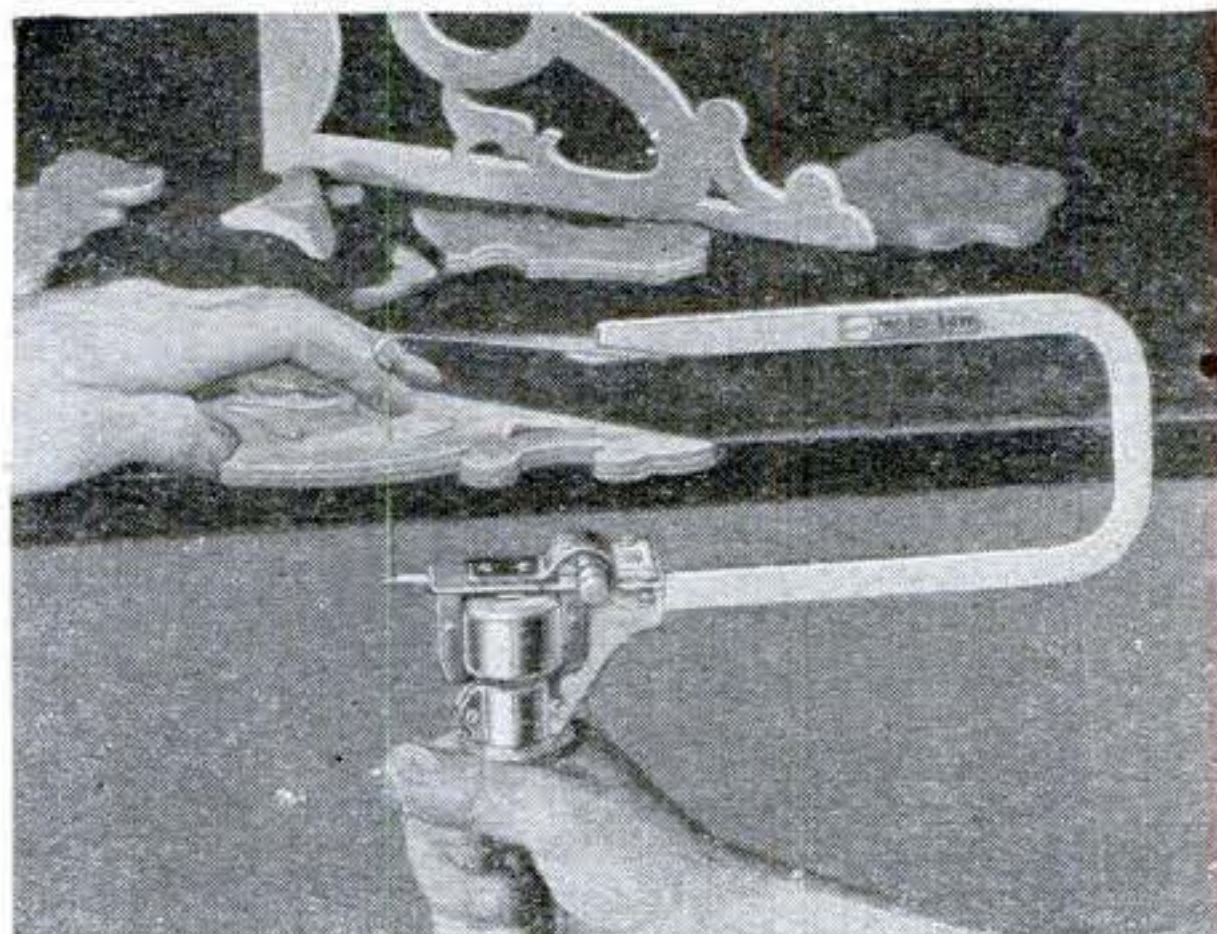
Moto-Tool is backed by over 12 years of industrial use . . . packs years of extra pleasure . . . yet, due to increased production, pre-war prices still prevail!

Look for These Moto-Tool Features

Oil-less, sealed bearings • Patented automatic chuck lock pin • Oversize armature shaft; hardened, ground, polished • Shockproof, bakelite housing • Dust filtered air cooling system • Dynamically balanced for vibration-less operation • Exclusive hanger hook • Weight only 13 ozs.

MOTO-SAW

THE AMAZING ELECTRIC SCROLL SAW



This electric coping saw works like magic! Easily cuts intricate scroll designs in medium-hard wood up to $\frac{3}{4}$ " thick. Runs 7,200 strokes a minute . . . just guide it! Has only two moving parts . . . never needs oiling. Operates on 110-120 volt, 50 or 60 cycle A.C. electric current. As safe as a handsaw . . . thousands of satisfied users. Comes complete with 3 saw blades, at only **\$5.85**

New DRILL PRESS

ONLY **\$9.95**

(Less Moto-Tool)

Only Dremel offers you a portable, precision drill press at such an amazingly low price. Just the thing for creating costume jewelry, model making, wood carving, routing, etc. Utilizes Model No. 2 Moto-Tool, which can be raised or lowered, swung in any direction, or quickly removed for off-hand use. Drill Press stands 12" high. Base is 6 $\frac{3}{4}$ " x 4". Weighs approximately 3 $\frac{1}{2}$ pounds.

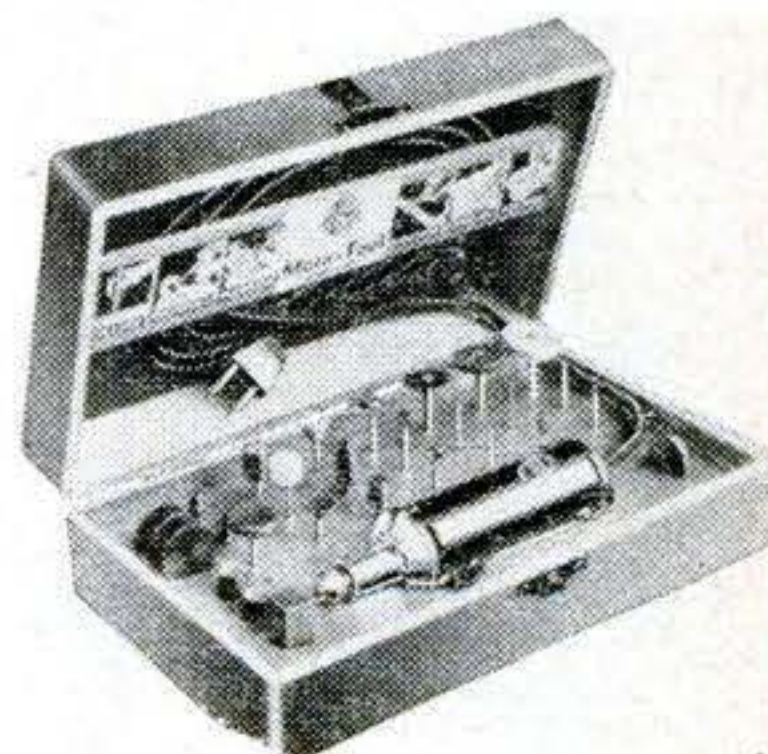


MONEY-BACK GUARANTEE

Buy Dremel Tools from your dealer. If he cannot supply you, use coupon below to order desired items on 5-day trial, money-back guarantee. Items checked will be sent complete and postpaid for check or money order in full. Or, send only \$2 with order, and pay postman balance plus postage upon C.O.D. delivery. Remember, YOUR MONEY BACK if not delighted after 5 days' trial.

DREMEL MFG. CO.
DEPT. T128-L • RACINE, WIS.

Here's BIG VALUE!



Model No. 1
MOTO-TOOL KIT
ONLY **\$17.50**

This highly popular Kit contains lighter Model No. 1 Moto-Tool and 34 practical accessories in attractive, lacquer-finish wood box. It's the biggest bargain in the field.

USE THIS COUPON TO ORDER

IF YOUR DEALER CANNOT SUPPLY YOU WITH DREMEL TOOLS

DREMEL MFG. CO., Dept. T128-L • RACINE, WISCONSIN

- ☐ Enclosed find \$..... (Check or money order in full). Ship items checked below at once Postpaid.
- ☐ Enclosed find \$2.00 as part payment on items checked. I will pay postman balance plus postage upon C.O.D. delivery.
- ☐ Moto-Tool Kit No. 2, \$23.50. ☐ Moto-Saw, with 3 blades, \$5.85.
- ☐ Moto-Tool Kit No. 1, \$17.50. ☐ dozen blades (60c per doz.)
- ☐ Drill Press (Less Moto-Tool), \$9.95. ☐ Free catalog of Dremel Tools & Equip.

NAME..... ADDRESS.....
CITY..... ZONE.... STATE.....

Troubled with DEAFNESS?

—then you'll be thrilled with the new revolutionary Zenith "75" Radionic Hearing Aid. You can order it *by mail* without risking a penny. Let a 10-Day Trial* at home, at church, at business, prove it's the finest hearing aid you can buy regardless of price. Saves you over \$100.00.

HEAR BETTER OR PAY NOTHING

Light, compact single unit. Costs less than a cent an hour for battery consumption. Comes ready to wear. Accepted by the Council on Physical Medicine, American Medical Association. Send postcard now (no obligation) for full particulars telling how tens of thousands of hard-of-hearing men, women and children have found new joy and happiness with this amazing new hearing aid.

*This Trial offer available on direct sales by Zenith Radio Corporation or its subsidiaries.

Makers of the World-Famous Zenith Radios. Leaders in Radionics Exclusively for over 30 Years.



Look only to your doctor for advice on your ears and hearing



ZENITH

**RADIO CORPORATION
HEARING AID DIVISION**

Dept. PS118, 5801 W. Dickens Av.
Chicago 39, Ill.

New ARMY MINE DETECTOR

AN/PRS-1 is a portable device for detecting Metallic and Non-metallic objects. You can use them to ferret out all kinds of Buried-Treasures, in the Mountains or on the Beaches. Its private use suggests the following: In the hills or mountains, all types of Metals and Non-metals; on the beaches any type of objects such as jewelry and coins. For commercial use such as tracing buried cable, wire and sewer tile. Locating buried metal or wooden boundary stakes, etc.

TECHNICAL FEATURES:

This unit actually is a Ultra high Frequency transmitter. A variation in radiance resistance, caused by any change in soil density, shows in a deflection of the Microammeter, discriminating between Metallic or Non-metallic objects by a swing to the right or left. Audio response in the Headset also indicates changes by an increase or decrease in the volume of the 1000 cycle tone. By lengthening dipole rods operator will be able to increase the depth sensitivity.

This unit comes complete with spare tubes, antenna dipole and reflector, and instructions manual, in wooden chest 9 1/2" height x 28 1/4" length x 15 1/2" depth. Weight in operation is only 22 lbs. LESS Batteries. Power supply: Three 45 volt and one 6 volt batteries. Uses standard batteries. Original COST \$285.00. Shipping Weight appr. 80 lbs. F.O.B., N. Y.



No C.O.D.'s

Our Special Price **\$26.40**
with battery
\$17.50 without battery

Send Orders to: **COLUMBO TRADING CO., INC.**
304 Canal St., Dept. P.S., N. Y. 13, N. Y.

New Advertising Machine

Prints & Illustrates 1¢ Post Cards

FREE Learn how thousands of business men, in every line, are boosting sales in spite of conditions—with 1¢ messages—printed and illustrated in a few minutes on gov't post cards—with amazing new patented **CARDMASTER**. Your "today's" ideas, read by your prospects next morning. Not a toy, but a sturdy advertising machine, built to last for years. Low price, sold direct. Guaranteed for five years. Send name today.

SEND NAME We'll send **FREE** illustrated book of money-making **IDEAS** for your business and complete, unique advertising plans. **RUSH YOUR NAME TODAY.**
CARDMASTER COMPANY
4546 RAVENSWOOD, Dept. 1611, CHICAGO 40, ILL.



NEW 1948 Plastics Supplies Catalog

Just off press. Full details on Plexiglas, Lucite, rods, sheets, tubes. Acetates, cements, dyes, buffs, molding sets, tools, carving kits, accessories. Everything in plastics. Gives prices, sizes, colors, etc. Price 10c. stamps or coin, with ad for catalog.

PLASTICS MFG. & SUPPLY CORP.
Dept. PS-11 4707 Euclid Ave. Cleveland 3, Ohio

GENUINE PEMCO WHEELS

6" x 1.50", 1/2" Bore, Oilite Bearings, \$1.35 Each
8" x 1.75", 1/2" Bore, Ball Bearings, \$1.85 Each

HEAVY DUTY with 3/4" Bore... Prices and Data on Request
Prices F.O.B. Kalamazoo

Finest Quality, Industrial Type Wheels. Ideal for toys, implements, garage and factory equipment. Semi-pneumatic Tire. Load Tested. Send Check or Money Order Today!

PARAMOUNT ENGINEERING & MFG. CO.
1872 RAVINE RD., KALAMAZOO, MICH

DEALERS WANTED!



The Gift Every Woman Wants

ACCURATE Minute Timer

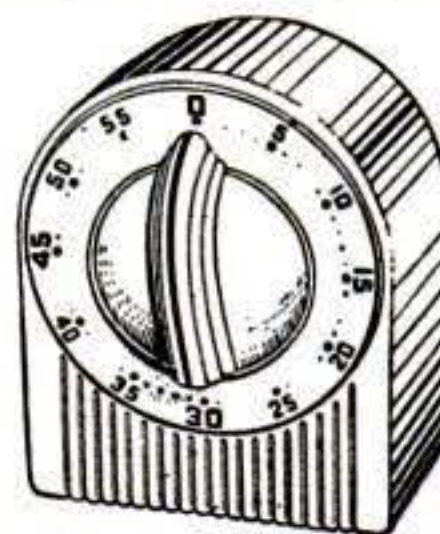
Leading domestic science experts state that one of the most important secrets of fine cookery is accurate **TIMING**. That's why successful home makers keep an accurate timer always in sight at the stove. Now, every woman can be a good cook. Accurate Timing is the secret! ... and it costs so little.

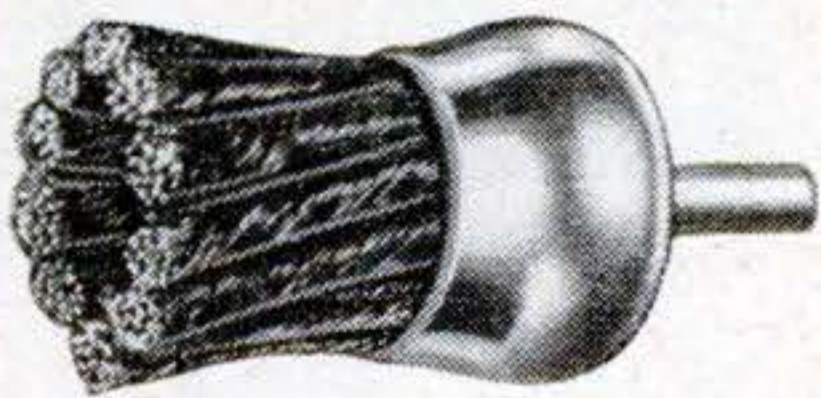
Simply turn the Accurate Minute Timer pointer to the time desired—that's all. When time is up it calls by pleasant sounding bell. This attractive precision instrument is a necessity at the stove or washing machine, in the photographic dark room, dentist's or doctor's office, etc. An unusual buy. **C.O.D. Only \$3.95 plus postage or send \$3.95 and save postage. An ideal gift.**

Money back if not satisfied

THRIFT PRODUCTS CO.

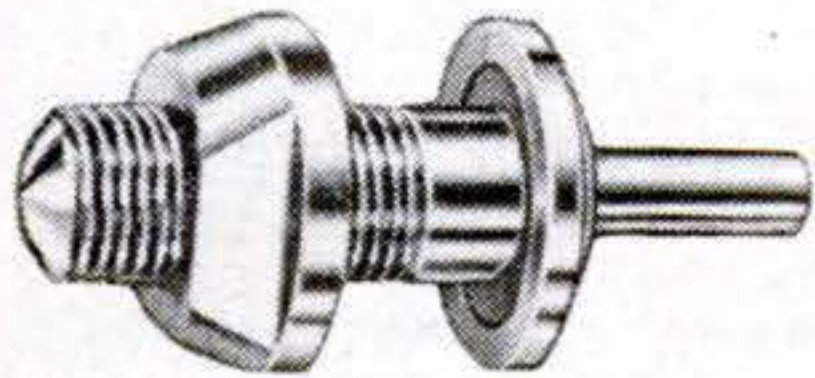
Dept. A 307 Fifth Ave. New York 4, N. Y.





CARBON BRUSH

Made of tightly twisted spirals of steel wire. Removes hard carbon deposits.



ARBOR ADAPTOR

Has 1/2" dia. arbor for use with brushes and grinding wheels up to 4" dia.



CIRCULAR HOLE SAWS

Has 1/4" pilot drill. Saw sizes range from 5/8" to 2". Shank fits 1/2" drill chuck.



CARBON BRUSH

Made of crimped bright music wire. Cleans carbon from cylinder heads and blocks.



WIRE CUP BRUSH

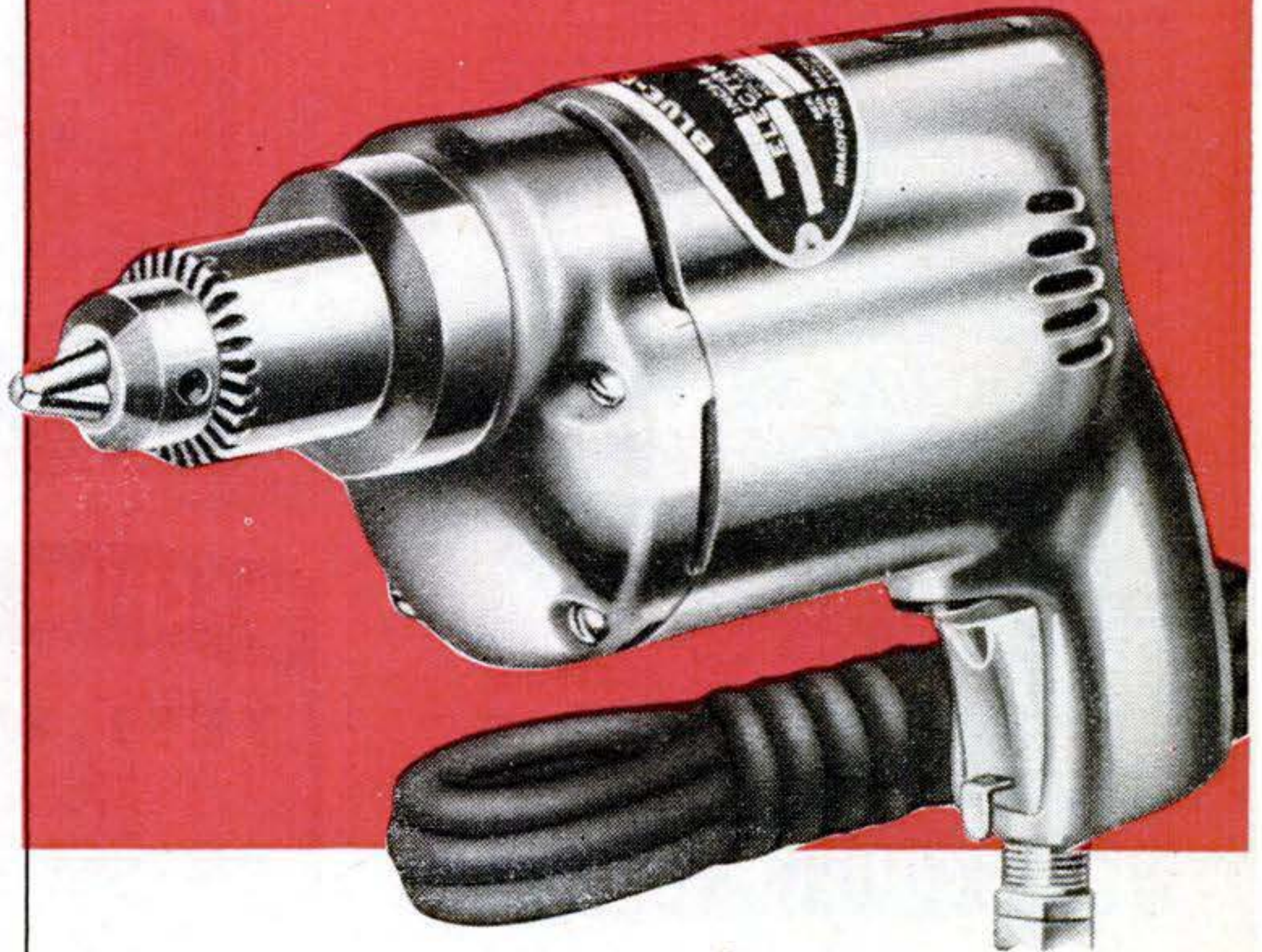
For use with disc sanders. Fitted with

5/8" x 11-thread bushing. Removes scale, rust, etc.

Snap-on

BLUE-POINT

Midget 1/4" Electric Drill



**gives you more speed...
more drilling power in close places!**

Here's a sturdy, dependable electric drill that packs a lot of power, yet is so compact that you can hold it in the palm of your hand. It's a great favorite with mechanics because it gives them drilling speed and power in close places... it gets in wherever your fist will fit. Comes complete with 1/4" Jacobs Chuck, key, and 15 feet of 3-conductor cable and plug. Mail the coupon for complete information.

SNAP-ON TOOLS CORPORATION

8060-K 28th AVENUE • KENOSHA, WISCONSIN
International Division: Kenosha, Wis., U. S. A.

Snap-on Tools

THE CHOICE OF BETTER MECHANICS

SNAP-ON TOOLS CORPORATION
8060-K 28th Ave., Kenosha, Wisconsin

Please send me more details about Electric Drill and accessories.

Name.....
Position.....
Company.....
Address.....
City..... (.....) State.....

HORMONES

PROMISE

RENEWED VIGOR TO MEN!

Today Male Hormones are bringing new hope to thousands of men who are worrying because of loss of power, nervousness, uncertainty and loss of initiative due to male hormone deficiency.

National Magazine articles have recently hailed Methyl Testosterone (the true male hormone) as a promise to men in extending the prime of life. It was referred to as one of the life-giving vital sparks that supplies the drive and energy so necessary to success.

SPECIAL INTRODUCTORY OFFER

FULL 30 DAY SUPPLY OF MALE HORMONE TABLETS

All you have to do to take advantage of this special introductory offer is to fill out the coupon below and mail it together with \$5.00 in cash, check money order and we will send by return mail your full one month supply of Genuine Methyl Testosterone (the TRUE MALE HORMONE), COD'S acceptable, you pay postman \$5 plus postage. Orders shipped in plain wrapper.

MAIL COUPON TODAY

Hudson Products Co. Dept. 11-B-2
341 Harding St., Long Beach 5, Calif.

I enclose \$5.00

in cash ☐ check ☐ money order ☐

Send COD and I will pay postman ☐

Please send full 30 day supply of genuine Methyl Testosterone tablets.

Name _____

Address _____

City _____ Zone _____ State _____

Bring Electrical Troubles "TO LIGHT" with

BRACH TEST-O-LITE



APPLIANCES



MOTORS



FUSES

The NEON glow
enables breaks, poor contacts, shorts, and defective electrical units to be located quickly in all circuits of 100 to 550 volts . . . indicates hot or grounded wires . . . tells AC from DC (and polarity).



Here's the ultra-convenient, time saving, modern tester for fuses, cut outs, radios, appliances, motors, outlets. Far superior to the ordinary, clumsy bulb. Operates one hundred per cent even on very minute current. The only pocket-size tester with Patented Safety Feature. Guaranteed for a lifetime.

95c at your local electrical dealer . . . or send \$1.00 to cover purchase price, mailing and handling.

L. S. BRACH MFG. CORP.

200 Central Ave. Newark, N. J.

MACHINE STEEL AND BRASS?

YES! WE'VE GOT IT!

- Ground and Polished Drill Rod Rounds
- Cold Finished Steel Rounds
- Cold Finished Steel Squares
- Cold Finished Steel Flats
- Cold Finished Steel Hexagons
- Free Cutting Brass Rounds
- Free Cutting Brass Hexagons

WRITE FOR FREE STOCK LIST

Get all the details now. Write for Free Stock List today. No obligation. Learn about special Introductory offer—handsome automatic lead pencil free with your first order for \$5.00.

CHESTERFIELD STEEL SERVICE CO.

Dept. PS-11 P. O. Box 3056 Cleveland 17, Ohio



ELECTRIC HEATING UNIT

Special electrode-type heating unit screws into ordinary hot water bottle as illustrated. Gives Safe, even heat. Amazing relief for many ills where constant heat application is necessary. Every home needs this handy item. Underwriter's Laboratory approved. Thermostat control. Foolproof. Bakelite construction. Complete with 6' cord. An excellent gift. Send cash, check, money order and we pay postage. Only \$3.95. C.O.D.'s accepted. FREE FOLDER. DEALERS and SALESMEN: Write for details THERMO ELECTRIC PRODUCTS CO., LTD. Dept. S 3727 San Fernando Rd. Glendale 4, Calif.

3-Pc PAINT STRIPE SET Only \$1.00



3 SEPARATE TOOLS—EACH MAKES DIFFERENT WIDTH

Stripe perfect lines—straight, curved, with any paint, lacquer, enamel, easy as drawing lines with ruler! Beautify furniture, toys, autos; make signs and imitation tile. Simple instructions included.

SEND NO MONEY. Mail order. Pay postman only \$1.00 plus postage. If not delighted return in 5 days for money back. Order Now.

STRADER MFG. CO., Dept. D-352
259 Strader Ave. Cincinnati 26, Ohio

AIR RIFLES BENJAMIN AIR PISTOLS

PIONEERS - LEADERS

SEND FOR FREE FOLDER OF LATEST MODELS TODAY

If you want a REAL GUN for PRACTICAL USE inside or outdoors get a SAFE - CLEAN - ECONOMICAL - BENJAMIN with Adjustable Power and Amazing Accuracy. For BEST RESULTS use BENJAMIN H-C PELLETS. WRITE AT ONCE. BENJAMIN AIR RIFLE CO., 811 MARION ST., ST. LOUIS 4, MO.

NOW—BALL BEARING LIVE CENTER LUBRICATED FOR LIFE!

Now for your own homecraft use . . . built to exacting industrial standards. Trouble-free, dirt-free . . . sealed for life with special ball-bearing lubricant. Saves shock and wear on lathe bearings. Precision built for sturdy, rigid accuracy. Standard 60 degree point.

With No. 1 taper shank—\$10.50; with No. 2 shank—\$11.00
With No. 3 shank—\$11.75 Postpaid if cash with order.

Inquiries from jobbers invited.

MASTERCRAFT MFG CO. Box 256, Hawthorne 1, N. J.





New SpeedWay COMBO KIT

\$29.50

at your local hardware
and electric stores.

Every home needs these basic tools!

Not only the home craftsman, model maker and mechanic, but everyone with a home, a car or a hobby needs a SpeedWay Combo Kit.

Here are the basic power tools needed wherever things are made, installed or repaired: No. 69 SpeedWay $\frac{1}{4}$ " Drill, with attachments for sanding and polishing.

A No. 129 SpeedWay Hand Grinder, that takes all arbor-mounted grinding wheels, rotary files, cutters and brushes, and accessories as shown (left).

With this kit you can drill holes up to $\frac{1}{4}$ " diameter, can grind, cut and shape steel, brass, wood, plastics, bone, etc. Tedious jobs like sand-papering, polishing and filing, scraping off rust, etc., actually become fun.

Designed and built by SpeedWay—manufacturers of quality power tools for over 40 years. These are not toys but capable electric tools with lots of power and correct operating speeds.

Sold by all leading hardware, electric, tool and department stores. (Ask for a demonstration.)

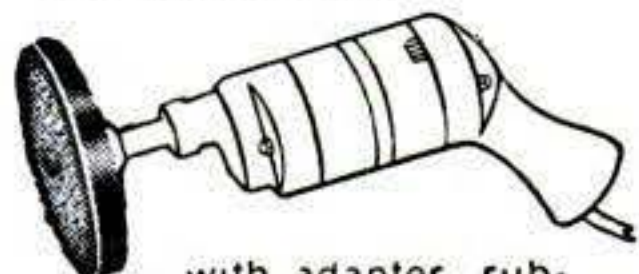
Write for **FREE** descriptive circular and the name of your nearest dealer.

Speedway Manufacturing Co.

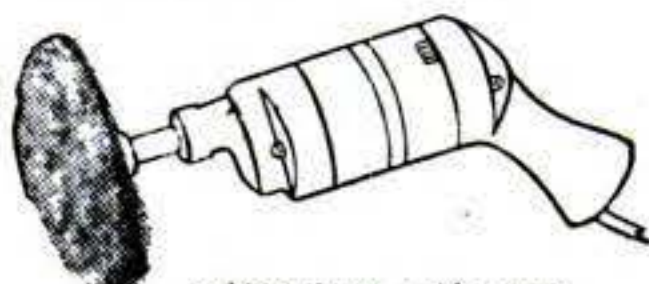
1864 So. 52nd Avenue
CICERO, ILLINOIS



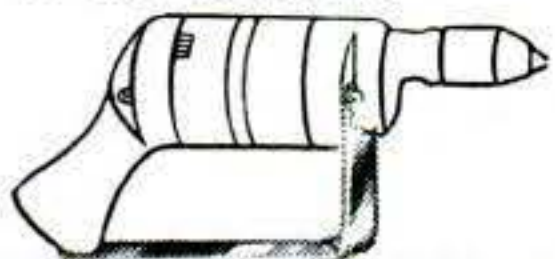
Powerful $\frac{1}{4}$ " Capacity Electric Drill—drills holes in steel or wood. Quality drill bit included.



with adapter, rubber backer, and abrasive discs, it makes a portable power sander (Adapter, backer and 10 assorted abrasive discs included)



with the slip-on lamb's wool bonnet, it is a portable power-driven polisher or buffer.



Snapped in the chromium plated Speed Stand, it becomes a horizontal drill stand, bench sander or polishing head.



High-Speed Hand Grinder (20,000 R P M)—For all mounted cutting burrs (for cutting steel wood bone plastics), grinding stones brushes and abrasive discs. Seven assorted accessories plus $\frac{1}{8}$ " and $\frac{3}{32}$ " collets included



Instruction Manuals—easy-to-follow guides to year-round fun and useful pleasure with your Combo-Kit.

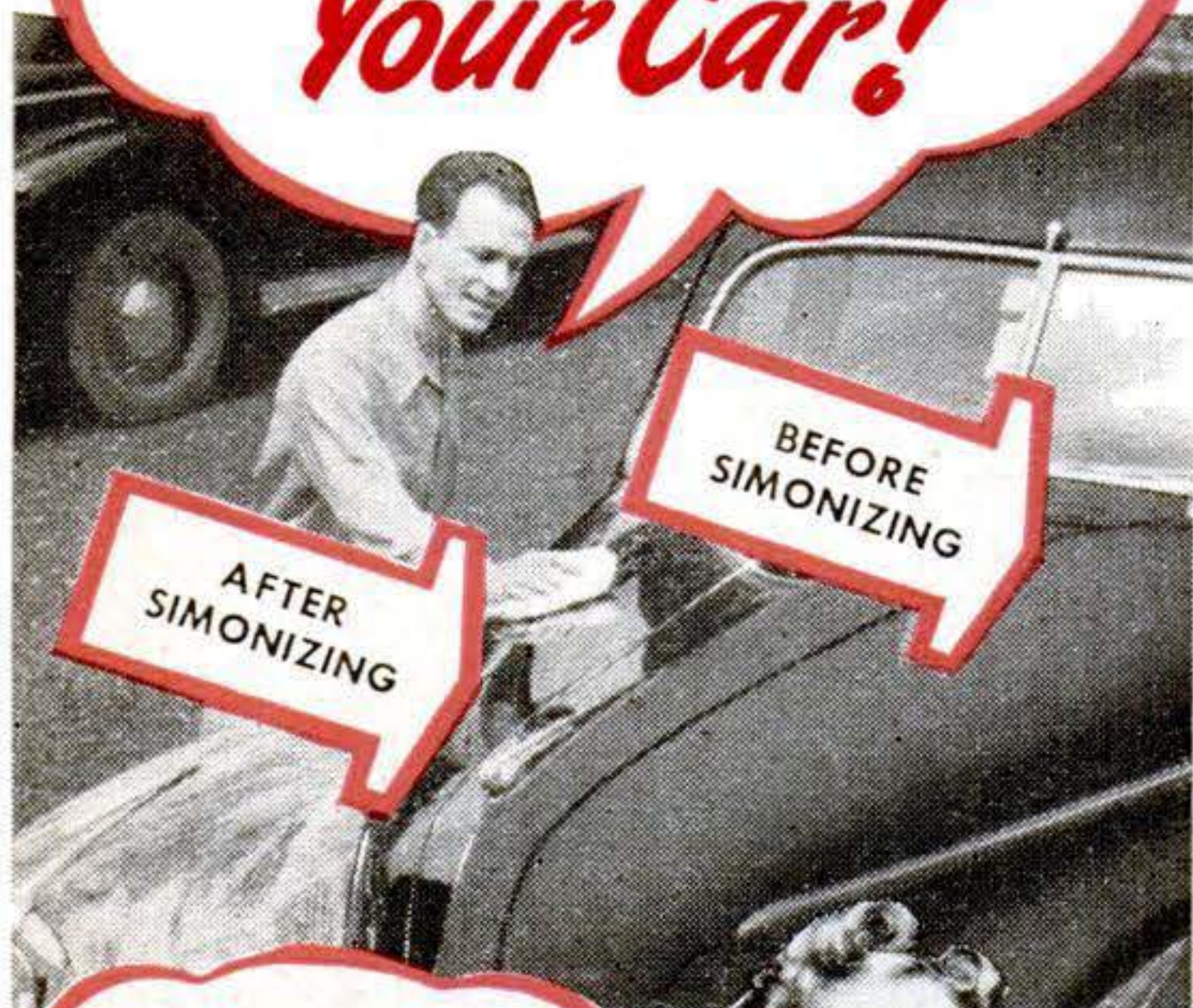
Note. The tools in the Combo-Kit operate on either 110-120 V AC or DC current



Here's "before and after"

proof why **You**

**Should Simoniz
Your Car!**



BEFORE
SIMONIZING

AFTER
SIMONIZING

GIVES TWICE THE
SHINE IN 1/2 THE
TIME!

KEEPS COLORS
FROM FADING!

Simoniz Kleener makes dull cars look new again

Nothing equals wonderful Simoniz Kleener—for safely cleaning the finish and making cars look really new again. Anyone can do a professional job of Simonizing without a buffer—just inexpensive Simoniz and Simoniz Kleener. Use Liquid Kleener for a "quickie slick-up" or before applying Simoniz. Extremely dull cars require Paste Kleener. To protect the finish and make it last longer—follow up with famous Simoniz!

THE SIMONIZ COMPANY, CHICAGO 16, ILL.



MOTORISTS WISE

SIMONIZ

T. M. REG. U. S. PAT. OFF.

MAKES THE FINISH LAST LONGER

Can You Operate a Local Plant?



More local plants are badly needed to make Brikrete—the world's most modern masonry. Several hundred territories are being opened up for local Brikrete manufacture by men of vision and aggressiveness. Brikrete ties in with today's huge building program. Makes possible better construction at lower cost. Truly better than brick; actually cheaper than lumber. Combines strength, safety, insulation value, colorful beauty and modern styling.

Beauty • Long Life • Low Cost

Brikrete is made in locally owned plants, using local materials and local labor. That's why high quality and low price still permit a 100% to 150% mark-up. We supply complete equipment; easy terms if required. Generous cooperation. Exclusive manufacturing privileges in protected territory. Write or wire for information and tentative reservation of territory.



BRIKCRETE ASSOCIATES, INC.
4675 S. Division, Grand Rapids, Mich.

BRIKCRETE



**NOW! You'll be
SAFER
DRIVING IN HEAVIEST RAINS
WITH WINGFLEX
ON VENTILATOR WINDOWS**

WINGFLEX drains off rain flowing down open ventilators. Keeps water from dripping in. Lets musty odors out. Prevents windshield "fog".

Fits All
Cars Except
new Stude



**\$1.95
PR.
POSTPAID**

Amazing new WINGFLEX lets you drive in greater safety with ventilator wings open...in stormiest weather! Shield drains off rain flowing down windows...protects upholstery and clothing from water dripping in. Circulating air relieves musty odors, stuffiness inside car...prevents windshield "fog"...reduces risk of accidents. Snap-clamp secures to bottom of ventilators, rubber seal prevents leaks. Made of chrome plated steel. Fits all cars except new Studebaker. \$1.95 pr. ppd. Send check or M.O. C.O.D.'s plus postage.

PRODUCT CO., Dept. PS-1
705 Olive, St. Louis 1, Mo.



REMOTE INDICATORS

Selsyn remote position indicators. When shaft of one unit is turned, remote unit shaft will follow to same position. Operates any distance with only simple electrical connections in between. For remote indication of weather vanes, tank liquid level, television or ham antenna direction, camera lens focus, film footage and hundreds of other applications. Complete with instructions and capacitor for 115 Volt AC house current operation.

**\$3.95
PAIR**

ADD 30c FOR POSTAGE & HANDLING

DUBIN ELECTRONICS CO., INC. Dept. PS-10
103-02 NORTHERN BLVD., CORONA, N. Y.

RUPTURED?

Get Relief This Proven Way

Why try to worry along with trusses that gouge your flesh—press heavily on hips and spine—enlarge opening—fail to hold rupture? You need the Cluthe. No leg-straps or cutting belts. Automatic adjustable pad holds at real opening—follows every body movement with instant increased support in case of strain. Cannot slip whether at work or play. Light. Waterproof. Can be worn in bath. Send for amazing **FREE** book, "Advice To Ruptured," and details of liberal truthful 60-day trial offer. Also endorsements from grateful users in your neighborhood. Write:

Cluthe Sons, Dept. 14, Bloomfield, New Jersey

MAKE YOUR GIFTS

... **SAVE MONEY** or **START A SPARE TIME, PROFITABLE BUSINESS** with **THIS AMAZING, NEW, SAFE** **SYNCRO** ELECTRIC **POWER SAW!**



The Gift They All Will Use!



The really amazing feature about SYNCRO Safe POWER SAW is this—it is the **ONLY** safe jig saw on the market and is so safe small children may use—yet so powerful, versatile, every adult craftsman needs it! By getting a SYNCRO for Christmas, you give something practical that can be used by *every member of the family!* It's economical—no motor to buy! Just plug into any 50-60 cycle, 110-120 volt A. C. only outlet—and saw! Cuts $\frac{1}{4}$ " hardwood and $\frac{1}{2}$ " softwood, also thin metals, plastics—clean and smooth—no sanding necessary! Portable—use anywhere in home, on farm, for pleasure or profit. New adjustable arm permits sawing ANY length material. New Off-On switch. Quieter operating. Sold on 10 Days Money Back Trial to prove it's the best, lasting gift to give or get. **TRY IT FREE NOW.** Read below!

Listed by
Underwriters
Laboratories, Inc.



Make this Cut-Out **FREE** AT YOUR HARDWARE STORE!

(Take To Your Dealer Today)

FREE TRIAL COUPON

MR. SYNCRO DEALER: This entitles bearer to saw out, on your SYNCRO SAW, **FREE**, one snapshot or picture bearer has pasted on $\frac{1}{4}$ " plywood or $\frac{1}{2}$ " softwood—or personally try SYNCRO at store using material you furnish.

SYNCRO CORPORATION, Rochester, Michigan

3. RESULT—
a realistic photo "cut-out" suitable for mantel, desk, dresser use or as a "gift"



1. PASTE GIRL ON WOOD



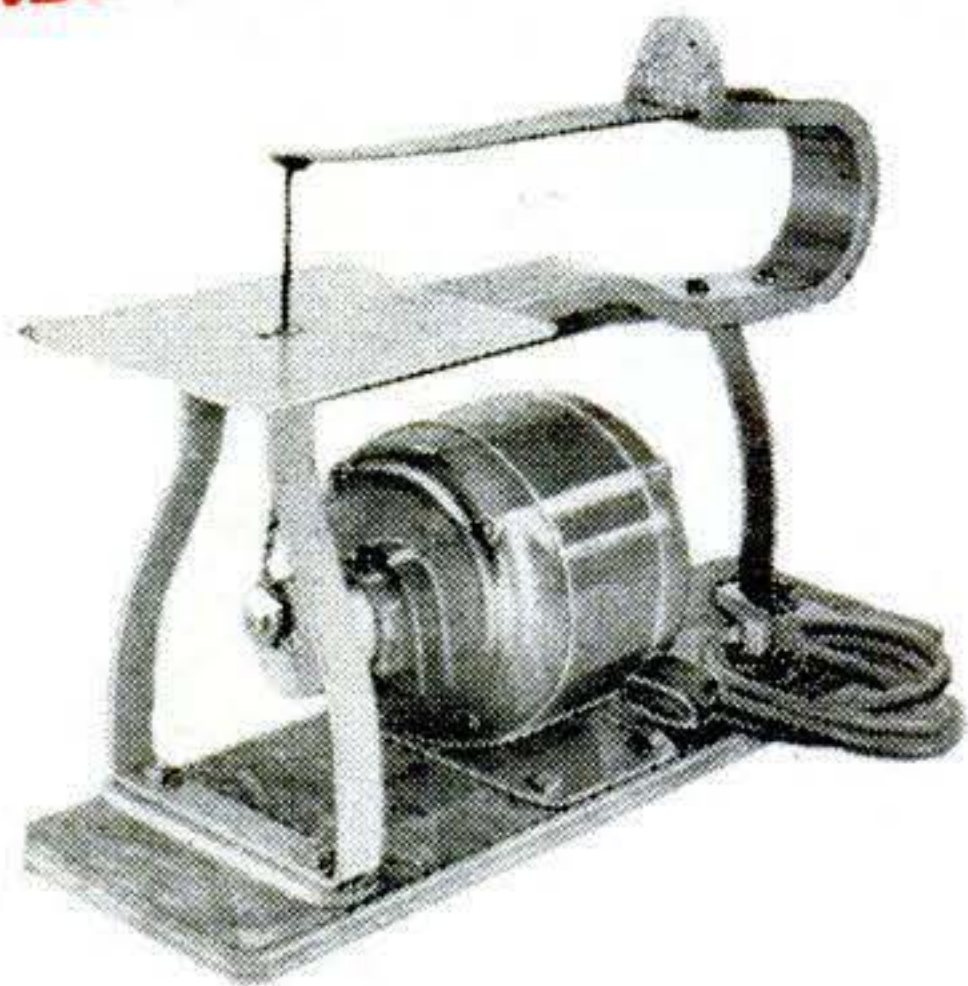
2. SAW AROUND GIRL



If there is no SYNCRO Dealer near you, do this: Send only \$17.50 (plus \$1 for shipping cost) direct to factory with name, address of your favorite hardware store—we'll ship saw to you **POSTPAID** on 10 Days Money Back Trial **AND** include **FREE** full-size Pattern No. 74 enabling you to make Name Plates, House Numbers, Signs for personal use, Christmas Gifts, or extra cash. Or rush postcard for full details. (Dealers: write for Special Introductory Deal Offer.) Hurry. Address:

SYNCRO CORPORATION
Dept. M-118 ROCHESTER, MICHIGAN
World's Largest Makers of Electric Jig Saws

TACKLE ANY CUTTING JOB!



MODEL A (with motor) — MODEL W (without motor)

—“Little Cut-Up”—

(REG. U.S. PAT. OFF.)

USES UNLIMITED

For Home or Factory

• Unexcelled for pattern makers, cabinet shops, manual training schools, shipping rooms, radio and print shops, binders, carpenters, furniture manufacturers and repairers, picture framing, window trimmers, sign work, theatres, home work shops, etc.

Safe as a Sewing Machine!

THE MODERN ELECTRIC SAW

- Guide Tension Springs
- Channel Steel Frame
- Instant Blade Change
- Adjustable Stroke Pulley
- Ball Bearing Connecting Rod

PATENTED INCUTTING ARC



Cuts “in” down, “recedes” up, cutting clean. No hold down arm required.

LOW PRICE!

Model A (with motor) \$45 — Model W (without motor) \$22.50

ACT NOW!

Order the fastest cutting Electric Jig Saw on the market. Thousands in use! Clip and mail coupon today!



Please send me the Beebe “Little Cut-up” Model _____.

☐ I am enclosing \$_____. Send prepaid.

☐ Please send COD. I will pay postage.

NAME _____

ADDRESS _____

CITY AND STATE _____

BEEBE BROS., 2720 6th Ave. So., Seattle 4, Wash.

THE BIGGEST LITTLE SAW IN THE WORLD

CARTWRIGHT'S

Patented

TRU-CUT TIN SNIPS

Easiest cutting tin snip. Handy tool for 1,001 jobs. Lightweight—will cut 18 gauge sheet metal. Very finest for cutting metal accurately to any simple or complex pattern.

Prompt Delivery

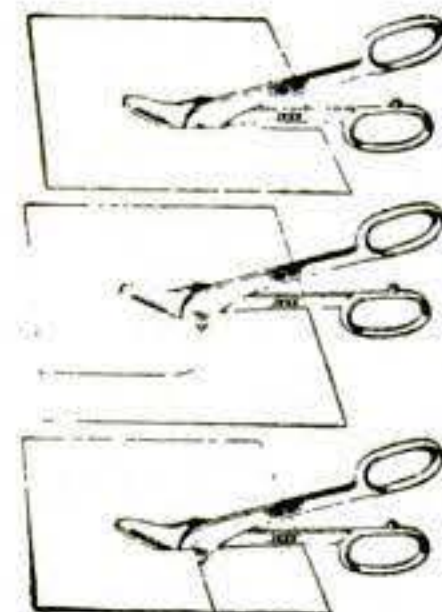


\$4.95 ea.

Post-paid on cash orders

Check These 7 Tru-Cut Features

1. Cuts a perfect circle, right or left. 2. Cuts square points, both ways, right or left. 3. Hands are always above material when cutting. 4. TRU-CUT Snips are patented and protected by J. Cartwright & Son, in business since 1885. 5. Tool is guaranteed against mechanical defects and will be replaced upon returning to factory. 6. Special “Cup Tension Washer” designed and made for TRU-CUT retains a tight fit. 7. Faster cutting. Truer cutting. Easier cutting. Less tiring. Stay Sharp Longer and will give Years of Service. Get this easy time-saving snip today. If dealer can't supply order direct from us. Send cash, check or money order, and we pay postage. SATISFACTION GUARANTEED. \$1.00 deposit on C.O.D.'s.



1. TRU-CUT fits the hand. Well balanced. Weighs only 2 lbs. 2. TRU-CUT will cut inside circle without wrinkling metal. 3. TRU-CUT cuts square points both ways on inside cuts.

Write for FREE CATALOG of complete line of pruning shears and hedge shears

J. CARTWRIGHT & SON

Dept. PS-11

Malaga

California

New!

FOR PLEASURE CARS

Fits Under Car Hood!

GROVER AIR HORNS

NOW, a powerful, more compact... easily installed high pressure air horn and air tank assembly that fits on firewall or side splash pan under car hood! Spun brass bells, true-tone harmony, heard for miles! Complete assembly features two matched GROVER air horns, self-filling air pressure reserve tank, bronze diaphragms, brass valve, control handle and all necessary copper tubing, rubber hose and fittings. Instructions furnished. Satisfaction guaranteed. If your dealer cannot supply you, write for facts NOW with make, model and year of your car to

GROVER PRODUCTS CO., 1219 So. Hope St., Los Angeles 15, Calif.

DEALERS JOBBERS INQUIRIES INVITED

LUMBER

A BOARD OR A CARLOAD

Harold Hunt wants to send you big, new No. 15-B Catalog. Over 148 pages of woodworking ideas. 12 pages of rare woods in colors. UNEQUALLED BARGAINS in imported and American woods, supplies, hard-to-find hardware. Send only 15c to cover postage and handling.

CRAFTSMAN WOOD SERVICE CO.

2729 S. Mary St. Dept. B-99 Chicago 8, Ill.

TOP GRADE KILNDRIED

Walnut
Mahog.
Cherry
White
Hard
Maple
Poplar
Oak
Aromatic
Red
Cedar

BUILD YOUR POWER TOOLS

WITH POLY BALL BEARING ARBORS

HEAVY DUTY GRINDER

3/4" x 17 1/2" precision spindle, self-lubricating ball bearings, heavy casting, V belt, 2 step pulley driven through rear or base.

ONLY

\$18.25

Ship wt. 13 pounds



Model D-12 Pictured

FREE! Write for POLY illustrated literature.

POLY BALL BEARING ARBORS
C4-1/2 x 12 1/2 spindle, housing 2 x 8, \$7.95 pp.
C5-5/8 x 12 1/2 spindle, housing 2 x 8, \$8.45 pp.
C6-3/4 x 12 1/2 spindle, housing 2 1/4 x 8, \$9.45 pp.
D8-1 x 17 1/2 spindle, housing 2 5/8 x 11, \$18.75 pp.
SHAPER ARBORS 3 inches between collars, C4-1/2 \$14.25, C5-5/8 \$14.25, C6-3/4 \$15.25, D8-1 \$23.00, B25-1/2 x 2" cap flange mount \$5.95.
PILLOW BLOCKS—Ball Bearing, 1/2 \$3.50, 5/8 \$3.50, 3/4 \$4.25.

POLY PRODUCTS, 2032-B E. Walnut, Pasadena 8, Calif.

BOYS!

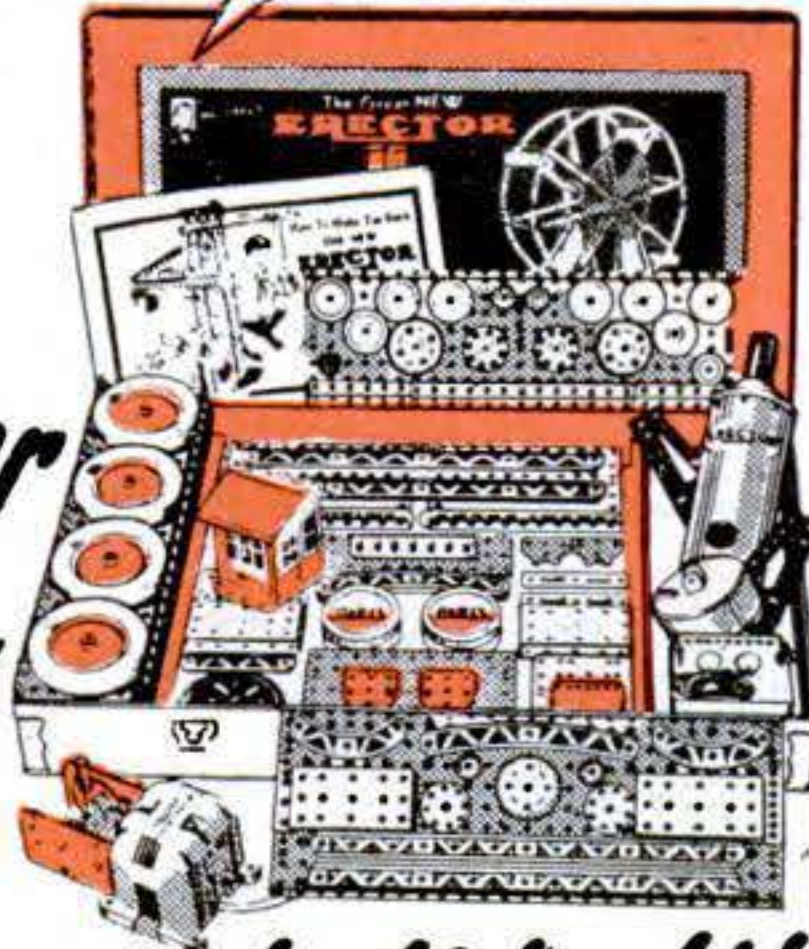
Look at all
the
Spectacular
Buzz-With-
Action

Models you can build with

ERECTOR®

Developed at the GILBERT HALL OF SCIENCE

ERECTOR
HAS GIRDERS OF
STEEL—TO
BUILD LIKE REAL!



LOOK! HE'S MADE OF METAL!
HE HAS ELECTRIC EYES! HE
WALKS BY REMOTE CONTROL!
HE'S THE MYSTERIOUS
ERECTOR WALKING GIANT!



No. 12½ Erector has 3
powerful motors, over 35
pounds of parts. Builds
mysterious walking giant,
remote control tractors
and crawlers, electromatic
cranes and hundreds of
other realistic action
models. Greatest Erector
of all time—\$50.00*

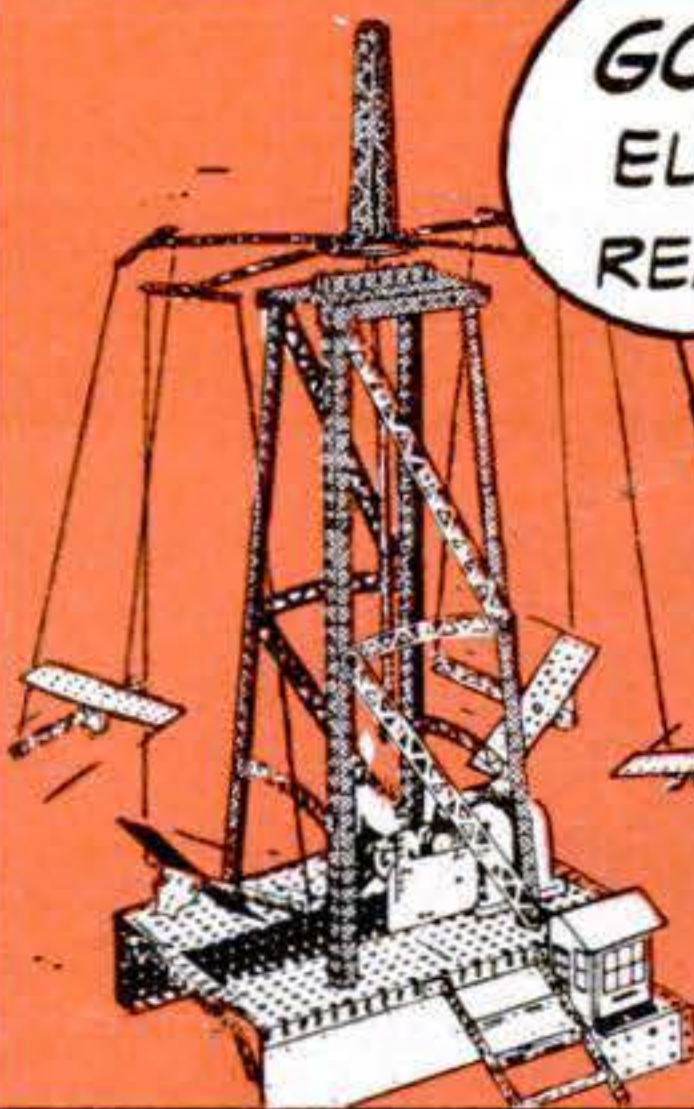
THIS GIANT FERRIS WHEEL HAS
ELECTRIC LIGHTS, REVERSING
ELECTRIC ENGINE...OPERATES IT IN
BOTH DIRECTIONS
AT HIGH OR LOW
SPEED!



Built with No. 8½ Erector—the All-
Electric Set. Most complete engineering
outfit Dad can buy for \$19.95*



GOSH...THAT ERECTOR
ELECTRIC ENGINE HAS
REAL POWER! IT MAKES
MODELS BUZZ
WITH ACTION!



AIRPLANE RIDE BUILT WITH SENSATIONAL NO. 6½ ERECTOR.
Loads of fun at the sensational low price of \$10.00*



Fun with Erector starts the moment
you open the big box and start to
assemble girders, wheels, gears
and other parts. Erector parts have
equi-distant holes, so that you just
count the holes to put them to-
gether. No other construction set
builds the square girder with inter-
locking edges and contains so
many parts. Curved, straight and
giant steel girders. Metal base
plates. Real engineering bolts and
nuts. 5 kinds of gears. Electric en-
gine. Electro-magnet. Electric
lights. Engineer's shack. Boiler
shells. Giant flywheel parts. Auto-
mobile wheels. See the new Erec-
tors wherever toys are sold.

*Denver and west, prices slightly higher

THIS
EXCITING
BOOK WILL
HOLD YOU
SPELLBOUND
!!



Copr. 1948,
Nat'l Com.
Pub. Inc.

FREE! SUPERMAN!

shows you the wonders of the Gilbert Hall of Science

What did Superman see with his x-ray
vision at the Gilbert Hall of Science? This
32-page book—crammed with color pic-
tures—tells you all. Mail coupon or post
card today.

Gilbert Hall of Science
411 Erector Square, New Haven, Conn.
Rush free book "With Superman at the
Gilbert Hall of Science."

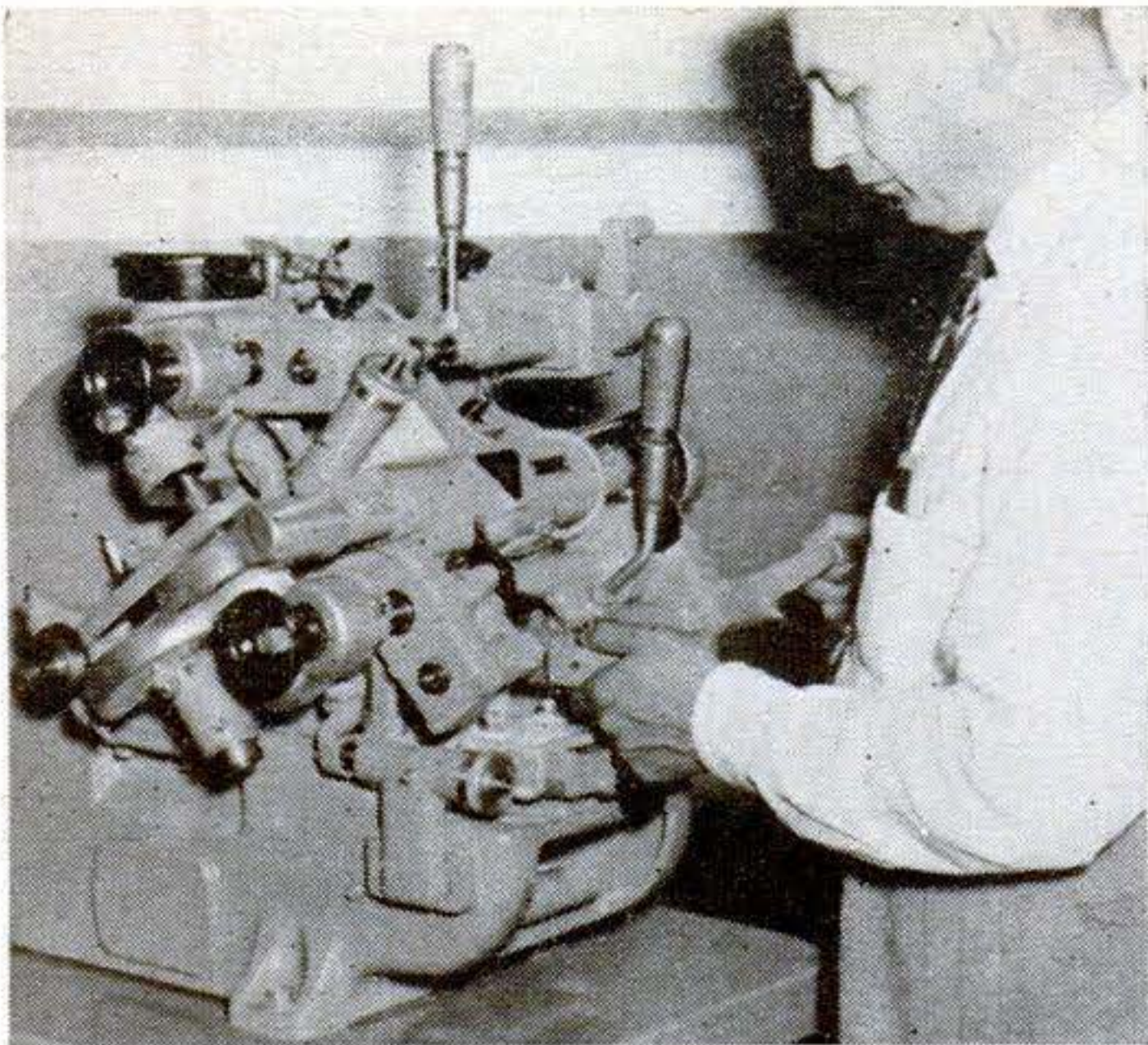
Name.....

Street.....

City.....State.....

(This offer good only in U. S. A.)

WHEN IN NEW YORK, VISIT THE GILBERT HALL OF SCIENCE. FIFTH AVE. AND 25TH ST. ADMISSION FREE!



Lenses Shaped Faster

THIS new high-speed Bausch and Lomb machine can edge 300 to 400 eyeglass lenses a day. A precision chuck permits exact centering of the lenses, while spring holders prevent them from turning. A new gauge cuts checking time from 20 minutes to three. The machine handles all lens types, is two and a half times faster than previous models.



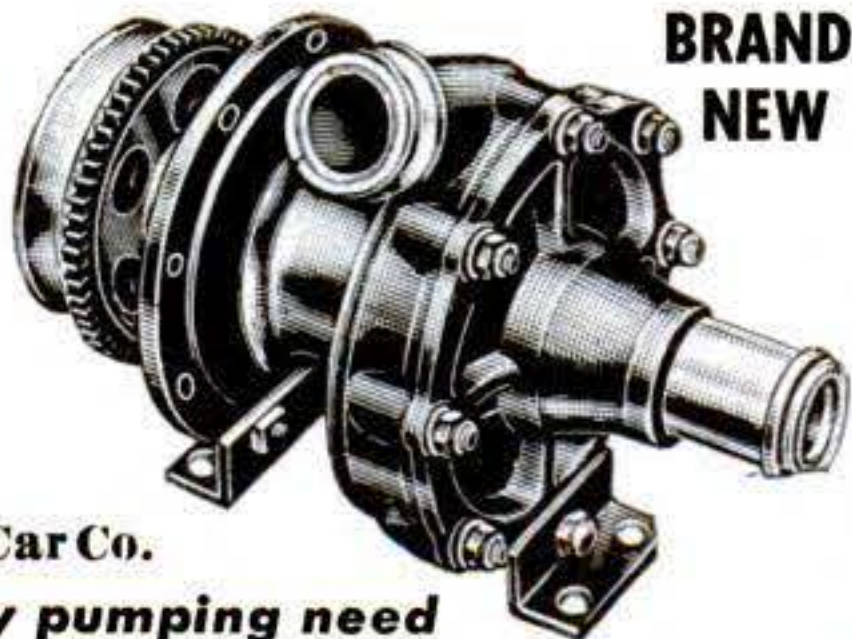
Radios Aid Lumbermen

WIDELY scattered logging teams in the Canadian wilds are using two-way, portable radios to warn each other of storms and forest fires, get weather forecasts, and report their progress to the mill. Made by GE, the 60-watt, FM radios consist of a transmitter and receiver shock-mounted in small wardrobe trunks. Nine units are now in use.

GROBAN'S—WAR SURPLUS BARGAINS

SHOP BY MAIL and SAVE
Better buys • Satisfaction guaranteed

ALL-PURPOSE WATER PUMP



BRAND NEW

Mfd. by Packard Motor Car Co.

Ready for use on any pumping need

Use it for:
DRAINING BASEMENTS

HOME WATER SYSTEMS

FIRE PROTECTION

PRESSURE BOOSTER

IRRIGATION

DRAINING PONDS, TANKS, etc.

SPRINKLING SYSTEMS
STOCK WATERING

INDUSTRIAL PUMPING

Complete with pulley and mounting brackets, ready for use.

Belt Driven Centrifugal Pump

An extraordinary value for all types of intermittent or continuous pumping in the home... farm... factory. Built to exact specifications of Packard Motor Car Co. for use in Rolls-Royce Merlin Aircraft Engines. May be run with electric motor, gas engine or power take-off on tractor. Delivers up to 25 gallons a minute with 1/4 H.P. motor; 80 gal. a min. with one H.P. motor. Will deliver up to 44 ft. head or 25 ft. suction. Use 1" outlet hose; 1" or 1 1/2" inlet hose (recommended).

Complete Engineering Reports and Operating Instructions Free with Pump

Has cast aluminum housing, accurately machined 5" bronze impeller; 3 1/2" V belt pulley and mounting brackets. Shaft rotates on ball bearing; has grease gun fitting.

Original cost approx. \$88.00. Shipping weight 10 lbs. A REAL BUY.

\$21.50
F.O.B. Chicago

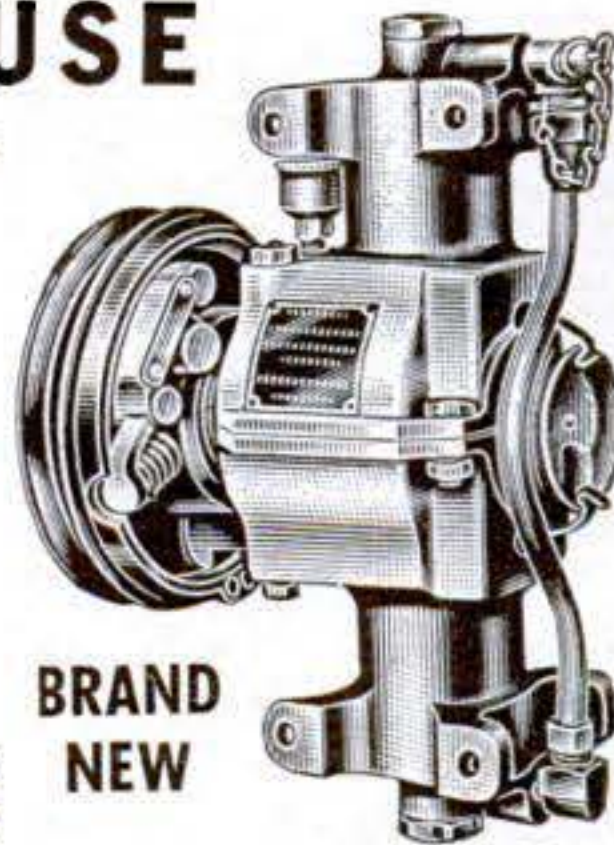
WESTINGHOUSE Air Compressor

War Surplus Bargain Special!

2 CYLINDER PISTON TYPE

Ideal For

- PAINT SPRAYING
- INDUSTRIAL USES
- TIRE INFLATING
- SPRAYING INSECTICIDE
- OPERATING AIR TOOLS



BRAND NEW

FOR THE HOME... FARM... FACTORY.

Designed for automotive truck or tractor mounting. Can be run off fan belt or power takeoff. Comes with automatic clutch. Can be installed for use on: farm trucks, jeeps, tractors, tire or garage service trucks, contractor or road building machinery, pneumatic devices, etc.

CAN BE OPERATED WITH 1/2 H.P. OR MORE ELECTRIC MOTOR OR EQUIVALENT PORTABLE GAS ENGINE.

Light weight, compact and versatile unit... delivers "oil free air"... simple in operation; requires minimum of maintenance; operates under all climatic conditions; suggested operating pressure 75 P.S.I.; equally efficient operation in either direction of rotation; approx. displacement 3.27 CFM at 600 RPM, 6.54 CFM displacement at 1200 RPM; 2" Bore—1 1/2" Stroke. Overall dimensions: width 9", height 11 7/8", depth 6 5/8"; approx. wt. 23 lbs.

A REAL BUY... worth many times this price

\$26.95
F.O.B. Chicago

WRITE FOR OUR FREE CATALOG!

ORDER DIRECT FROM AD SATISFACTION GUARANTEED
Send payment or purchase order today

GROBAN SUPPLY CO.
1507 S. MICHIGAN AVE., Chicago 5, Dept. PS-11

GROBAN'S-WAR SURPLUS BARGAINS

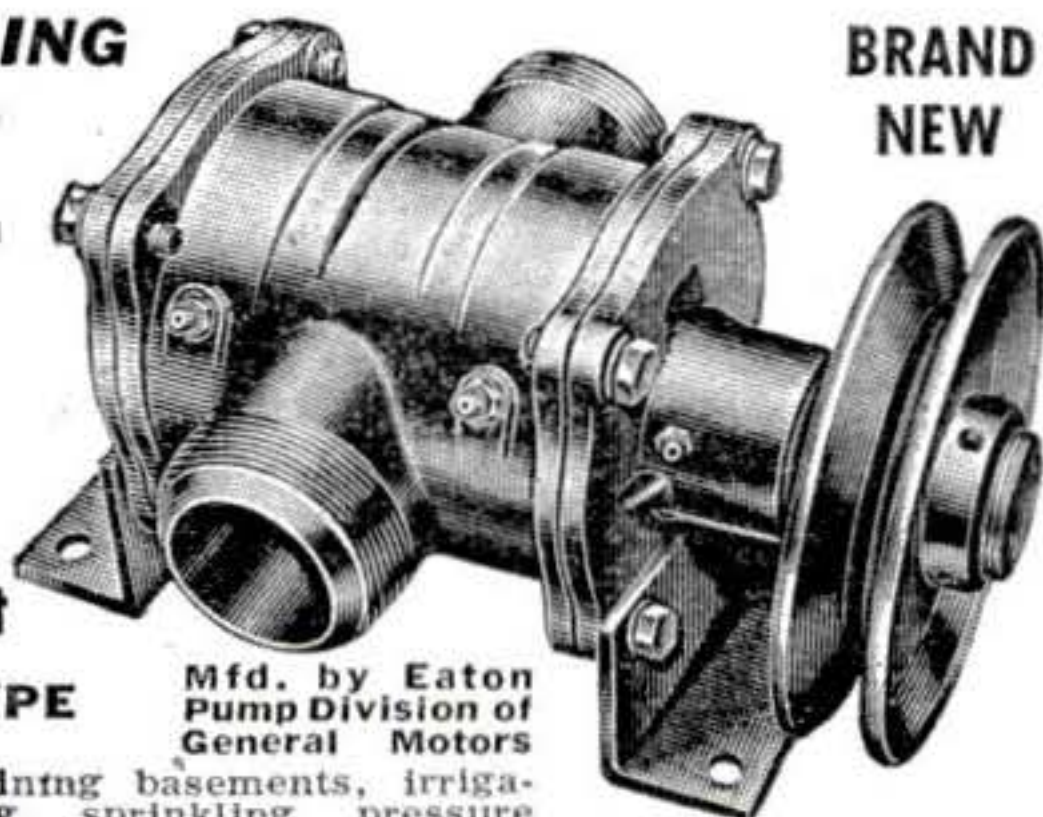
SHOP BY MAIL
and SAVE
Better buys • Satisfaction guaranteed

SELF-PRIMING

BRONZE PUMP

Positive
Displacement

GEROTOR TYPE



BRAND
NEW

Mfd. by Eaton
Pump Division of
General Motors

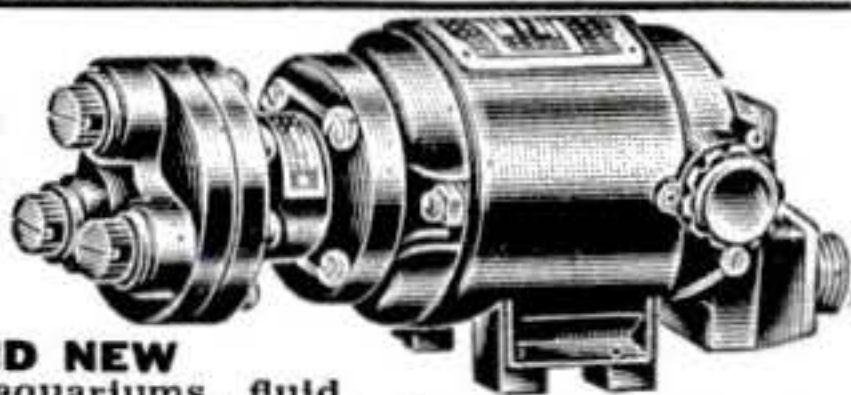
Perfect for draining basements, irrigation, fire fighting, sprinkling, pressure booster, insecticide and other spraying, fuel transfer, stock watering, industrial pumping, deep well jet pumping and home water systems. Rated 25 ft. suction and 100 ft. head pressure at 65 gallons a minute with 1725 RPM at one H.P.

COMPLETE ENGINEERING REPORT AND INSTRUCTIONS FREE WITH PUMP

Supplied with mounting brackets and 6" V belt pulley, ready for instant use. Standard 1 1/2" inlet and outlet pipe thread. Dimensions: 9 1/2" x 7 1/4" x 4 1/4". Ship. wt. 18 lbs. A \$142.00 value.

\$32.50
F.O.B.
Chicago

SELF-PRIMING ELECTRIC PUMP



COMPACT—BRAND NEW

Applications: oil burners, aquariums, fluid metering, fuel pump, tool post grinder, coolant pump, pressure lubricating pump, general industrial, etc. Motor mfd. by Black & Decker; double ball bearing series wound, continuous duty, 1/30 H.P. electric motor, rated 12,000 R.P.M. Transformer included for use on 110 V AC current. Also applicable for 24-32 V DC.

Pump mfd. by Weldon Tool Co. with standard 1/4" tubing ports; rated 2 G.P.H.; remove pump and use motor as high speed grinder. Overall dimensions: 7 3/4" long x 3 1/4" wide x 3 1/4" high. Approx. wt. 5 lbs. \$51.00 value.

\$12.95
Postpaid

BRAND NEW THREE-IN-ONE MULTI-PURPOSE PUMP

Three independent pump sections running off of one shaft, for single or multiple pumping. Use one as a vacuum pump capable of drawing 25 inches of mercury. Use one or two as a liquid pump for hydraulics, insecticide spraying, pond and basement draining, stock watering, aeration, etc.

Supplied with 4" V belt pulley. Inlets and outlets 3/8". Easy to use—foot mounting. Constructed of bronze and aluminum to exacting ordnance specifications. Dimensions: 6"x5"x4 3/8". Ship. wt. 10 lbs. Government acquisition cost \$74.00. YOUR PRICE...

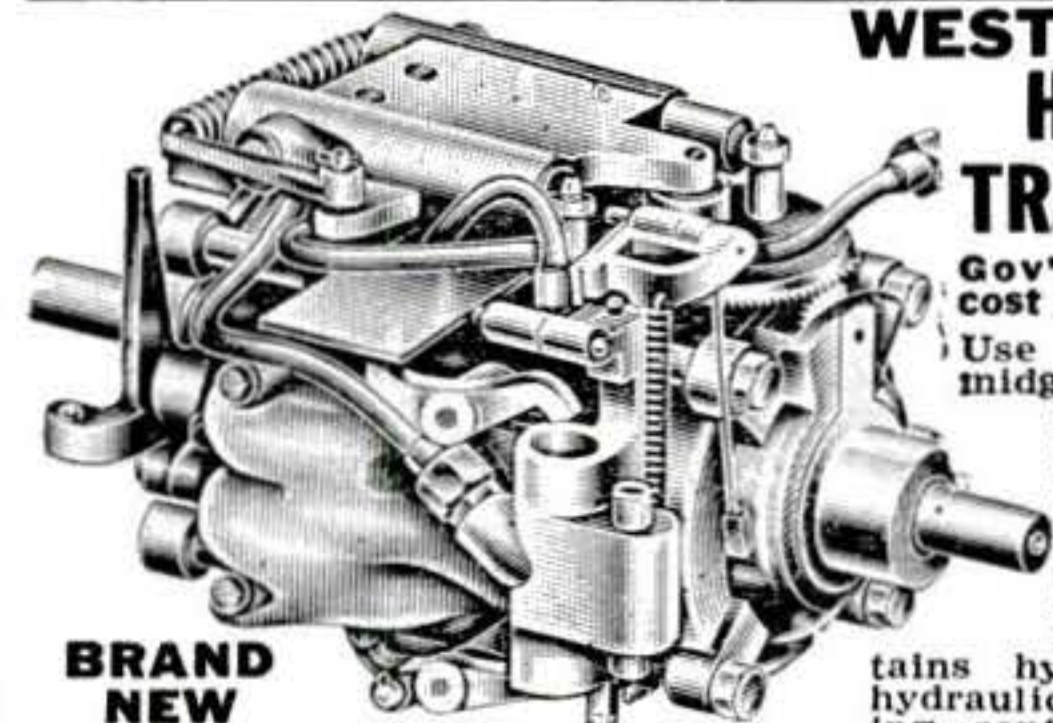


\$19.75 F.O.B.
Chicago

WESTINGHOUSE HYDRAULIC TRANSMISSION

Gov't. Acquisition cost \$300.00

Use it on chain saws, midjet autos, lathes, drills, power machinery, chucking machines, farm machinery, potters' wheels, tractors, trucks, etc. Ideal as hydraulic torque converters. Contains hydraulic pump and hydraulic motor; has reversing controls. Designed for



BRAND
NEW

use on 2 ton 40 mm anti-aircraft guns; contains 10 ball bearings and high quality precision workmanship, made to exacting specifications of ordnance department. Overall dimensions: 12" long x 5 1/2" wide x 6 1/2" high. Ship. wt. 19 lbs. NOW ONLY

\$18.95
F.O.B.
Chicago

BRAND
NEW



AIR OR OIL HYDRAULICS

• Use hydraulics on arbor presses, hydraulic presses, hay lifts, manure loaders, lift trucks—push or pull, tilt or turn, press or squeeze, open or close, lift or lower—and other hydraulic and industrial applications. Use with either air or oil . . . of finest precision workmanship.

1 Double action, 1 1/2" bore, 5" stroke, will lift 1760 lbs. in one second with Vickers MF6 Pump. Wt. 3 lbs. A \$35.00 value. **\$8.95** post-paid

2 Double action, 1 1/2" bore, 9" stroke, will lift 1760 lbs. in one second with Vickers MF6 Pump. Wt. 4 lbs. A \$45.00 value **\$10.95** post-paid

3 Use these cylinders on farm trucks, bulldozers, hay lifts, manure loaders, etc. Double action, 1 1/2" bore, 27" stroke. (Will lift 1760 lbs. in 2 seconds with Vickers Pump.) Wt. 8 lbs. A \$55.00 hydraulic cylinder value for only **\$12.95** post-paid

4 Double action, 2 3/8" bore, 8" stroke. (Will lift 4400 lbs. in one second with Vickers Pump.) Will withstand 1500 P.S.I. against wall. Wt. 7 lbs. A \$65.00 value **\$14.50** post-paid

5 Double action, 3" bore, 12" stroke. All steel hydraulic cylinder, will lift up to 12,000 lbs. (7000 lbs. in 3 seconds with Vickers Pump.) Complete with fittings. Wt. 12 lbs. A \$78.00 value **\$19.50** post-paid

6 Double action, 3 1/2" bore, 11" stroke. (Will lift 9600 lbs. in 7 seconds using Vickers MF6 Pump.) Complete with fittings. Wt. 15 lbs. A \$92.00 value **\$22.50** post-paid

HYDRAULIC CONTROL VALVES

BRAND NEW



Outlets are standard 1/8" pipe thread and inlet takes standard 1/4" copper tubing fitting.

1 Four-way control valve for use with double action hydraulic cylinder, may be used with 1500 P.S.I. hydraulic system to open and close hydraulic cylinders. Brand new. Ship. wt. 4 lbs. \$38.00 value. **\$7.95** post-paid

2 Four-way control valve for use with two hydraulic double action cylinders. Each cylinder may be operated independently of the other or in conjunction with the other. Oil may be locked in any of the cylinders to hold the piston at any required position. Brand New. Ship. Wt. 6 lbs. A \$60.00 value. **\$10.95** post-paid

3 A two cylinder double action valve with a unique arrangement, allowing the operator to raise both cylinders simultaneously, to lower them simultaneously or to raise one and lower the other at any predetermined rate and speed. Brand New. Ship. Wt. 8 lbs. A \$75.00 value. **\$14.95** post-paid

VICKERS MF6

Hydraulic Pump or Motor

Compact, powerful, rated 1,000 P.S.I., .507 cu. in. per revolution, 8 gal. per min. at 3750 r.p.m. Change rotation by reversing flow. Delivers up to 6 H.P. BRAND NEW. Wt. 4 1/2 lbs. \$60.00 value for **\$14.95** Postpaid



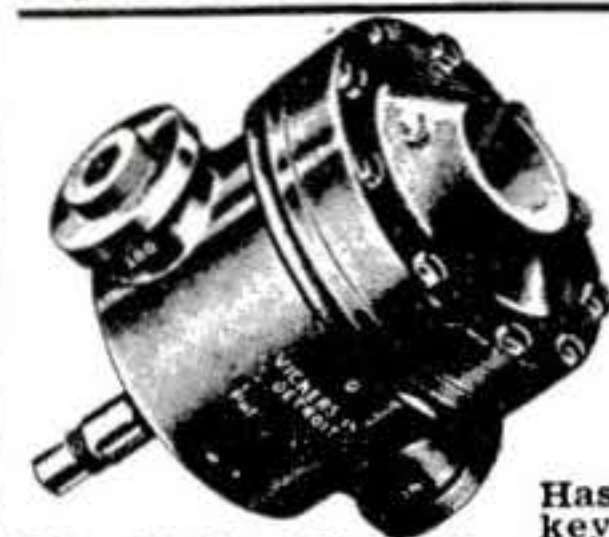
Brand New CHECK and RELIEF VALVE

Adjustable for any pressure

\$2.95 post-paid

VICKERS HEAVY DUTY HYDRAULIC PUMP

BRAND NEW



For tractors, bull-dozers, construction machinery, lift trucks, industrial applications, etc. Used on Ross Carriers. Delivers 18 gal. per minute at 1000 P.S.I. at 1200 R.P.M. using 10 H.P. Has 1 1/2" intake; 1 1/4" outlet; threaded and keyed 3/4" shaft for direct or pulley drive. Wt. 40 lbs. Dimensions: 5 3/4" diameter, 7 1/2" high. Original value \$148.00. NOW **\$39.50** F.O.B. Chicago

WRITE FOR OUR FREE CATALOG!

ORDER DIRECT FROM AD
Send payment or purchase order today
SATISFACTION GUARANTEED

GROBAN SUPPLY CO.

1507 SOUTH MICHIGAN AVE.

Chicago 5, Ill. Dept. PS-11



**Tightens
blades by
lever action!**

MILLERS FALLS PRESENTS
Still another
NEW TOOL!

80th Anniversary
No. 300 Hack Saw
Frame and Blade

\$3.50

Slightly higher in the West

"Greatest thing that's happened to hack saws since they made 'em adjustable!" — that's what tool experts said when they previewed this new Millers Falls hack saw frame. They were talking about its *lever-action* that quickly tightens blades to right tension. And that's just one feature of this rugged "life-time" hack saw. Adjustable to take both 10" and 12" blades. Cutting edge can be set to face right or left, up or down. High-quality steel throughout. Finished in gleaming nickel-plate. Beautifully balanced. And take another look at that tough, resilient, gleaming red *molded* handle — it's rugged! Your hardware dealer has the No. 300 *now*. See it soon! Millers Falls Company, Greenfield, Massachusetts.

Celebrating 80 Years of Toolmaking

Millers Falls Tools

266 POPULAR SCIENCE

**STOP
CHANGING
MOTOR OIL!**

End this needless waste and expense forever with

RECLAIMO Today's Most Advanced Oil RE-REFINING Filter

Continuously cleans and **RE-REFINES** motor oil as you drive (by utilizing motor heat)—keeps oil in high grade lubricating quality at all times—reduces motor wear to a minimum! Proves conclusively that "Oil Does Not Wear Out Mechanically" as stated by U. S. Bureau of Standards, (Bulletin 86).

"RECLAIMO"

- REMOVES SOLIDS (by filtration)
- REMOVES WATER (by distillation)
- PREVENTS Excess Fuel Dilution
- PREVENTS Acid and Sludge Formation

MAINTAINS Stable Viscosity ELIMINATES All Oil Changes

CAR • TRUCK • TRACTOR OWNERS!

You'll want to know more about Reclamo's Oil, Motor and Money-Saving Features. **FREE 40-PAGE BOOK "OIL FACTS"** gives you the complete "Reclamo" story plus details about our **New 90-Day No Risk-No Cost TRIAL OFFER!** WRITE for YOUR COPY TODAY!

RECLAIMO MFG. CO.

5083 ELSTON AVE., Dept. 85, CHICAGO 30, ILL.



**NEW ADDED
FEATURE!**

**Gas - Moisture
Vapor Injector**
Increases Mileage
with Smoother
Performance



**START A BUSINESS
at HOME... others make
BIG MONEY**

**DOES THE WORK OF
6 TOOLS IN 1**
Holds 20 times its
weight in water



Hands
Never
Touch
The
Water
..

Can Be
Put In
Boiling
Water

"Enclosed find 56 orders representing 9½ hours work on Monday and Tuesday." "Enclosed are 12 orders secured after supper this p.m."

Housewives Pleased

Everyone that sees this outstanding **CELL-U-MOP** immediately want one... That's the reason our distributors are so successful. For **MOPPING, WAXING, WALLS, WINDOWS, AUTOS and CLEANING RUGS.** Sells quick to Taverns, Clubs, Hotels, Hospitals, Stores, Restaurants, Homes, etc. Drain Bracket squeezes out water thoroughly. Write for **FREE** particulars

CLOSED CELL-U-MOP CO., Dept. PS-11, FREEPORT, ILL.



WOOD CARVING

9" TALL FIGURINE Postpaid in U.S.A. **\$1.85**

This beauty is easily carved in white pine with a mahogany and velvet base. Complete kit includes Material, Tru-Form templates and instructions. For more new and unusual projects send 10c for latest catalog.

BRAUN-CRAFT 1232 ETOWAH, DEPT. P-11 ROYAL OAK, MICHIGAN



MILL IT ON YOUR LATHE
PALMGREN MILLING ATTACHMENT

Mill, slot, grind, groove, square shafts, recess-on lathe. Shops, schools, homes need this fixture. Fits Craftsman, Atlas, So. Bend, Logan, Sheldon, Perkins and others. Accurately graduated for rotary and vertical feed. No. 150, 1½" Jaw \$18.75. No. 250, 2½" Jaw, \$24.75. No. 400, 4" Jaw, \$39.75.

ORDER TODAY! Write for Circular No. 10
CHICAGO TOOL and ENGINEERING CO.
8396 South Chicago Avenue Chicago 17, Illinois

Ingenious New Technical Methods

To Help You
Increase Efficiency



Light Projector Increases Thread Grinding Production

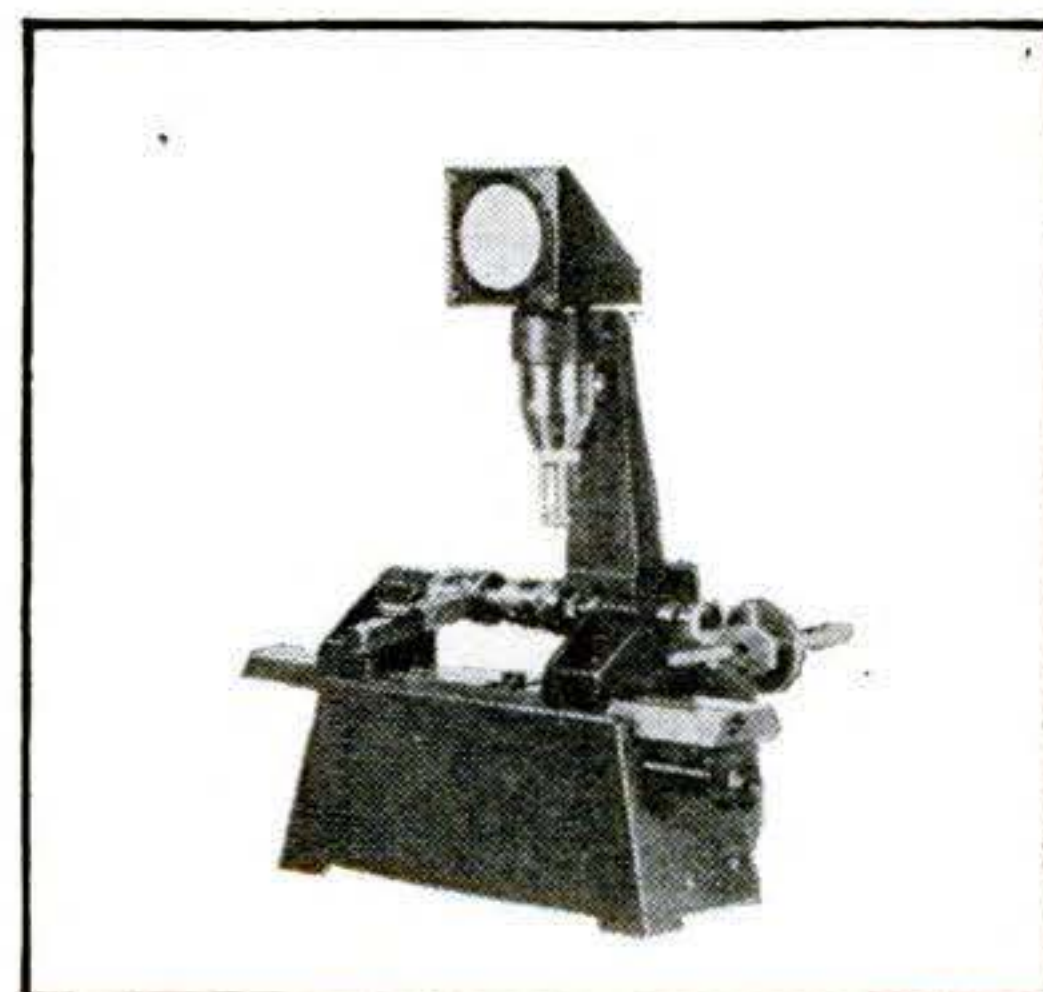
Production of thread grinding machines can now be increased through the use of a light projecting device called the Thread Pick-up Projector. The thread profile appears in a viewing screen, magnified 20 times, thereby permitting accurate visual adjustments.

In operation the Thread Pick-up Projector is placed alongside the thread grinding machine. A Dalzen Thread Grinder, Model No. 1, is shown above. While the machine is grinding the thread, the operator, using the Light Pick-up Projector, adjusts a "dog" on the next piece to be ground. When the "dog" and piece are then placed in the thread grinder the thread profile is automatically in location and ready for grinding immediately.

Even the most inexperienced personnel can "pick up the thread" using this instrument after only a few minutes demonstration. Grinding is also done more accurately and the viewer permits measurements of reliefs, notches, etc. to .0005 inch.

Efficiency of Production can also be increased through the use of chewing gum. The act of chewing helps relieve nervous tension and seems to make the work go easier and faster. For these reasons, Wrigley's Spearmint Chewing Gum is being made available more and more by plant owners everywhere.

*Complete details may be obtained from
Acme Scientific Company
1457 West Randolph, Chicago 7, Illinois*



Thread Pick-up Projector



AC-79

GLASY-CAST.....

NEW LIQUID PLASTIC COLD-SET

15 to 30 minutes for a
FINISHED PRODUCT

No heat, or machinery required. Crystal clear, brilliant gloss in natural state. Colored pigments or dyes may be added for solid or transparent effect.

GLASY-CAST

can be poured in flexible or rigid molds, including molds made from liquid rubber, Plaster of Paris, Elastomeric vinyl molds, and even certain types of wax molds. Glasy-Cast is a real moneymaking material and requires no experience.

MAKE BIG PROFITS with GLASY-CAST manufacturing novelties, toys, jewelry, etc. **EMBED FLOWERS, COINS,** biological specimens, and many other items in clear solid Glasy-Cast. Make your own Christmas gifts.

FREE INSTRUCTIONS WITH EACH ORDER OF GLASY-CAST

SMALL QUANTITIES AT WHOLESALE PRICES.
1 quart.\$2.50, 1 gallon.\$9.50.
5 gallon lots.\$8 per gallon.
Prices FOB Boston.

ELASTO-MOLD, A NEW FLEXIBLE

mold material makes permanent production molds in a few minutes at low cost. No shrinkage. Practically 100% efficient for use in casting Glasy-Cast as well as any other plastic material.

Hundreds of castings can be made from Elasto-Molds, instructions with each order. Prices on request.

WE ALSO SELL GENUINE LIQUID RUBBER

at \$5.50 per gallon, FOB Boston. Write for free sample of Elasto-Mold and Glasy-Cast casting. Money Back Guarantee if not satisfied.

PLASTIC SERVICE, Dept. P-2,

294 Washington Street, Rm. 813, Boston 8, Mass.

Decorative

METAL WORK

A new manual for the amateur. Tells in easy to understand language how to make useful metal articles in your home workshop. You'll be surprised how easy and interesting metal work really is. Fully illustrated with diagrams and step-by-step instructions. Sturdy cloth binding. 253 pages. Send only \$2.00 and your copy will be sent postpaid. Popular Science Monthly—Dept. 118-B, 353 4th Ave., New York 10, N. Y.

MANY NEVER SUSPECT CAUSE OF BACKACHES

This Old Treatment Often Brings Happy Relief

Many sufferers relieve nagging backache quickly, once they discover that the real cause of their trouble may be tired kidneys.

The kidneys are Nature's chief way of taking the excess acids and waste out of the blood. They help most people pass about 3 pints a day.

When disorder of kidney function permits poisonous matter to remain in your blood, it may cause nagging backache, rheumatic pains, leg pains, loss of pep and energy, getting up nights, swelling, puffiness under the eyes, headaches and dizziness.

Don't wait! Ask your druggist for Doan's Pills, a stimulant diuretic, used successfully by millions for over 50 years. Doan's give happy relief and will help the 15 miles of kidney tubes flush out poisonous waste from your blood. Get Doan's Pills.

CARTWRIGHT'S All-Purpose TRAILER HITCH

\$7.65

Engineered for
**FARM EQUIPMENT
& SPORTSMEN
STURDY, FAST
THEFTPROOF**



One of the fastest and most rugged trailer and farm equipment hitches ever built. Hitches and unhitches in a jiffy. Hitch constructed of cold rolled steel—withstanding 17,000 lb. direct pull. Forged carbon steel ball in thread sizes—5/8", 3/4", 1" Theftproof—secures trailer with padlock. No wrenches, pins or nuts to lose.

Hitch, ball, lock washer & nut, all for only \$7.65. Postpaid on cash orders. Extra balls \$1.75 ea. C.O.D.'s \$1. dep. If your dealer can't supply, order direct. Specify ball size.

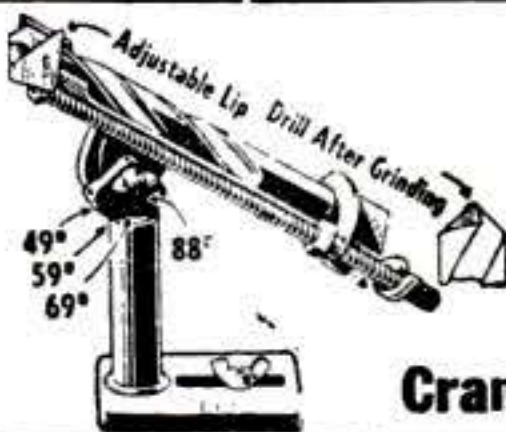
J. CARTWRIGHT & SON, Dept. SP-11

Malaga

California

**NONE
BETTER!**

SUPER DRILL GRINDER



Sharpens round shank drills from 3/32" to 1/2" in diameter, up to 6" long. Grinds old drills like new in 4 different point angles, using hand or power grinding wheels. Money-back guarantee.

Price only \$2.95

At Dealers or Postpaid

Crandall Mfg. Co. 1512 W. Slauson, Dept. FB-35, Los Angeles 44, Calif.

NEW! ADJUSTABLE VERNIER SIZE BLOCK (NOT A HEIGHT GAGE)

CUTS PRODUCTION AND TOOL COSTS

... 10 in 1 TOOL ...

An inexpensive adjustable size block now made available for precision readings, unusual versatility and speed. For the engineer, mechanic, inspector and home machinist. Usage—as gage blocks, direct reading planer gage, space and feeler gage; insider Vernier calipers, adjustable parallels, square and as a jack. Does the work of a height gage. Set tool heights on planers and shapers, stops and trips on machines; set dial indicators on comparators, sine bars, snap gages and many other tools and instruments about the shop. Range 0-6" 5850 combinations of .001" Model-100.

\$36.50

Write for free descriptive literature—Dealers: Attractive territories open

BARR INSTRUMENT CO., INC.

134-39 225TH ST.,
SPRINGFIELD GARDENS 13, N. Y.

WHIPS THE DARK!

800 foot spot, or handy floodlight. Dozens of uses! Stands, hangs at any angle. 80-100 hrs. on 6-volt battery. A genuine Delta. At hdwe., sport, elec. stores. Less battery **\$4.65**

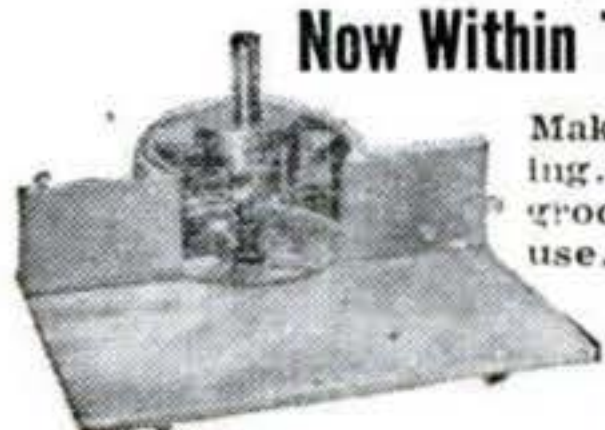


Delta ELECTRIC CO.
MARION, INDIANA

POWERlite 2-LITE ELECTRIC LANTERN

New Precision Built Commercial Wood Shaper and Matcher

Now Within The Reach Of Every Home Workshop



Make corner matched joints, panelling, fluting, routing, notching, inlay, tongue and groove and joints. Designed for commercial use, now simplified design and mass production brings it within the reach of every one. Just attach in chuck of drill press and it's ready to use. Write for complete FREE information.

Write for FREE information **T & H Mfg. CO.** 811 East 31 St. Dept. DS-3, Kans. City, Mo.



FREE for Trailer Builders

Safety-Engineered

• TORQ-LESS AXLES • BULL DOG HITCHES
AND PARKING JACK LITERATURE

HAMMER BLOW TOOL CO.

Dept. D-30 • WAUSAU, WIS.

FREE . . . WRITE TODAY!



WANTED MEN Between 18 and 65 TO LEARN A TRADE

Write today for free information—no obligation. No salesman will call.

P. S. KING, President

2870 Elston Ave.

Chicago 18, Illinois

"Build Your Own" AC welder & power plant

Save \$200 to \$300

Produce your own AC electric power to do arc welding or operate lights, tools, appliances, etc., with this one compact AC-AC generator. Connect to a good used gas engine, tractor, truck or line shaft and belt. Simply move the switch on the side to "welder" or "A.C. Power" as desired and use in hundreds of ways.



Check HOBART coupon for more details

FREE "Build-Your-Own" booklet... Write for it.

HOBART

Hobart Bros. Co., Box P-1181, Troy, Ohio
"World's Largest Builders of Arc Welders"

Make BIG MONEY Arc Welding!

Combination A.C. arc welder plus...

A.C. power

for lights, small tools, motors, etc.

You get all these **EXTRA ADVANTAGES** in one machine



Think how you can increase your income by doing an unlimited variety of welding jobs in the shop, in the field, or anywhere. With this gas engine drive unit, you weld, operate lights, run small tools and do hundreds of big-profit jobs, independent of power lines.

A Money-Making Workshop

Use arc welding to build a profitable business of your own. Be sure of success with a Hobart made to fit your plans. There's a size and type to fit every welding need.

A.C. (alternating current) transformer welder

Ideal for shop work. Lets you do repair work and fabricate metal products that sell at a profit. Easy to operate, makes better welds. Highly efficient. Made in 180 to 500 ampere sizes.

It's Easy to Learn Arc Welding

Let HOBART train you in a short time at low cost. Individual instruction by expert instructors. Qualified under G. I. Bill. Check coupon.

HOBART BROS. CO., Box P-118, TROY, OHIO



Gas Drive Welder



Welder with D.C. Power

HOBART

"World's Largest Builders of Arc Welders"



Electric Drive Portable



A.C. Transformer Welder



Generator Only



free a book of information for all weldors.

HOBART BROS. CO., Box P-118, TROY, O.

Without obligation send me complete information on the items I've checked.

Use this coupon!

- ☐ A.C. Welder—A.C. Power
☐ Electric Drive Portable
☐ A.C. Transformer Welder
☐ Welder with D.C. Power

- ☐ Generator Only
☐ Gas Drive Welder
☐ Build Your Own AC-AC

free Check here for Pocket guide.

NAME _____

ADDRESS _____

CITY _____ STATE _____

THE GIFT OF BETTER SHOOTING

with a MOSSBERG SCOPE



ALL MOSSBERG
SCOPES \$9.95



Without Scope

Here's a gift that keeps on giving
— giving better vision, higher
scores, more game, greater fun!



With Scope

MOSSBERG SCOPES FIT
ALMOST ALL MAKES OF
RIFLES UP TO .25-.20 CAL.

Internal Adjustment — 4-Power
Model #5M4 for low mounting
Model #8M4 for high mounting
Model #4M4 for Mossberg auto-
matic rifles only

SEE THEM AT
YOUR DEALER'S

Free descriptive
folder on request

No sales at factory

O.F. Mossberg
 & SONS, INC.

89711 St. John St., New Haven 5, Conn.

FASTEST PLANER in the WORLD at this Low Price... \$215.00

BELSAW Multi-Duty Planer



Speed up production! Increase your
profits! BELSAW power self-feeds at 24 feet per
minute... The lowest-priced surfacer
that will handle 12x6 in. stock. Planes
green or dry sawed lumber into smooth,
worked forms. Three high-speed steel
knives make 42 cuts per inch. Multi-duty
BELSAW takes inexpensive attachments
for all planing mill operations — Jointing,
Rabbeting, Grooving, Matching. BELSAW
is the **only** 12 in. planer providing **attach-
ments for jointing and grinding its own
knives**. Start planning NOW for BIGGER
VALUE and BETTER PERFORMANCE,
with BELSAW. Write for FREE speci-
fications, illustrations and low prices.

● LARGER CAPACITY ● FASTER
OUTPUT ● KNIFE SHARPENING
ATTACHMENT

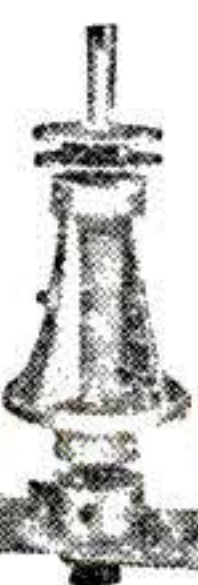
BELSAW MACHINERY CO B1021 Field Bldg., 315 Westport Rd., Kansas City, Mo.

BUILD YOUR OWN POWER LAWN MOWER

WHY BREAK YOUR BACK MOWING FIELD OR LAWN?

WRITE
FOR
FREE

Building
Instructions
The Rite-Way
Mower
Attachment
Ball Bearing



SAVE MONEY
SAVE TIME

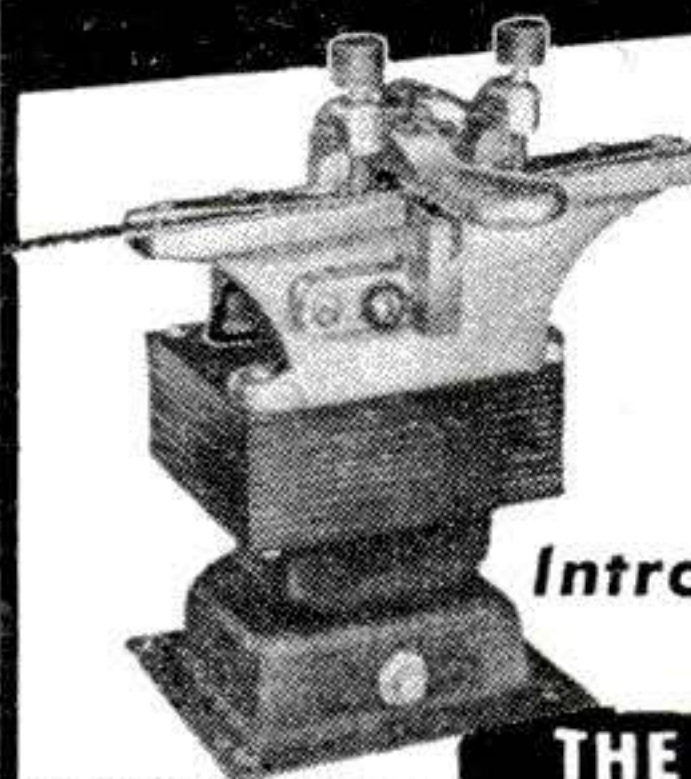
Now anyone,
can save time
and effort mowing field or lawn by build-
ing their own whirl type power mower.
Build according to your own ideas and needs at
small cost. Cut close to fences, walks, buildings,
etc. Build in short time with parts and instruc-
tions we furnish. Save hours of time and back
breaking labor. Write today for FREE information.

T & H MFG. CO., Dept. M-141
811 E. 31, Kan. City 3, Mo.



IT'S FUN TO BUILD

NEW BAND SAW BRAZER



SAVES TIME
AND MONEY...

better than welding — easy
to use — operates on 60 cycle
lighting circuit Complete
kit includes resistance brazer,
silver solder, flux, and
instructions

Introductory price **\$18.50**

SEND YOUR ORDER TO:
DEPT. PS11

THE ERWOOD COMPANY
214 WOODSTOCK STREET
CRYSTAL LAKE, ILLINOIS

WANTED

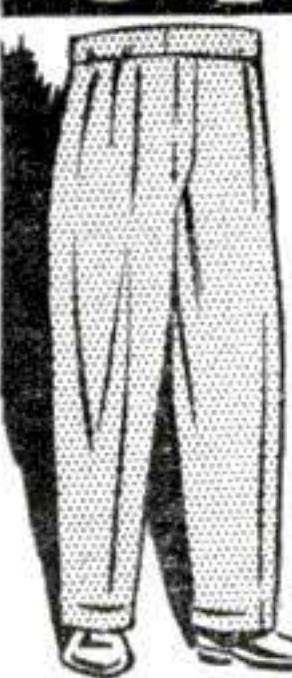
PRODUCTS TO MANUFACTURE

Well known manufacturer of nationally advertised
line of metal products in Sporting goods field has
excellent precision assembly and production facili-
ties available for the manufacture of small metal
products with production peak occurring between
May and October. Very favorable labor situation.
Will handle production on contract basis, or con-
sider both manufacture and sale (of royalty) if
products lend themselves to distribution through
their National sales organization which is set up
to cover Sporting goods, Hardware and Department
store field. Initial contact by letter only.

RANGER, INC.

ROCKFORD, MICHIGAN

OFFICER'S PINKS



Quality Year Round Dress Trousers

**\$9.95
PR.**

Beautifully tailored of finest ELAS-
TIQUE material. Officers have to
look well dressed. Fully guaran-
teed. Wrinkle-proofed to hold
crease. Tailored for correct fitting,
styling and comfort. **BRAND NEW!** Zipper front.
Roomy pockets. Sizes 30-42 in assorted lengths. Sold
thousands. Item now scarce. Order while supply lasts.
SEND NO MONEY. Just name, address, size. Pay post-
man only \$9.95 (previously \$14.95) plus charges on
delivery. Cash orders sent postpaid.

LEONARDS & LEE SURPLUS SALES
69-71-73 E. 75th St., Dept. O-103, Chicago 19

FOUNTAIN TOOTHBRUSH



Works much like a foun-
tain pen. Carries the
dentifrice in handle.
Most sanitary and con-
venient toothbrush ever

devised. Give a twist of the wrist and in 2 seconds the dentifrice
is on the brush and it is ready for use anytime, anyplace. No
mess. No waste. No abrasive to injure the teeth or gums. Handy
to carry in pocket or purse. Complete dental hygiene at home or
away. A perfect brush for every user including denture wearers
and those who have halitosis or sore gums. Money back guarantee.
3 months supply of dentifrice and fountain brush only \$1.60 post-
paid or C.O.D. plus postal charges.

See your dealer or order direct

ESCORT LABORATORIES, INC.

DEPT. B-1119 DIME BUILDING, DETROIT 26, MICH.

Harvey E. Whitman
Jackson, Mich.
Senior 1st Award
\$4,000 Scholarship



Howard Eichen
San Francisco, Calif.
Senior 2nd Award
\$3,000 Scholarship



Leon Levand
Washington, D. C.
Senior 3rd Award
\$2,000 Scholarship



Howard K. Graves
South Bend, Ind.
Senior 4th Award
\$1,000 Scholarship



Ronald Johnson
Portland, Ore.
Junior 1st Award
\$4,000 Scholarship



Tom Goad
Birmingham, Mich.
Junior
Dup. 1st Award
\$4,000 Scholarship



Major Award Winners 1948 Competition BOYS! \$65,000 IN AWARDS

Paul E. Jaquish, II
Saginaw, Mich.
Junior 3rd Award
\$2,000 Scholarship



Build model cars for the 1949 Fisher Body Craftsman's Guild Competition — 734 awards — university scholarships worth up to \$4,000 each—cash—trips—tool chests!



Harold L. Simon
San Antonio, Tex.
Junior 2nd Award
\$3,000 Scholarship

Richard A. Norton
Chicago, Ill.
Junior 4th Award
\$1,000 Scholarship

Any boy 12 years old or over and not yet 20 on September 1, 1948, may enter the competition to design and build a model car. Junior and Senior Divisions with identical awards let you compete with boys of your own age. No dues or entrance fees. Awards include Model Builders' Tool Chests, cash, all-expense trips to the Guild Convention, and 8 university scholarships worth \$1,000 to \$4,000 each. (Duplicate awards are given if sons of General Motors employees win.) Judges include deans or presidents of 10 leading technical schools and universities.

Write for free membership. Each new member receives a membership card and button, a full set of plans and instructions, *all free*. Competition closes at midnight July 1, 1949. You can win one of these awards! Mail the coupon NOW and get started.

FISHER BODY CRAFTSMAN'S GUILD

Sponsored by: Fisher Body Division of General Motors
General Motors Bldg., Detroit 2, Michigan

Gentlemen: Enroll me in the Fisher Body Craftsman's Guild 1949 Model Car Competition. Send me full instructions without charge.

Name _____

Address _____

City _____ Zone _____ State _____

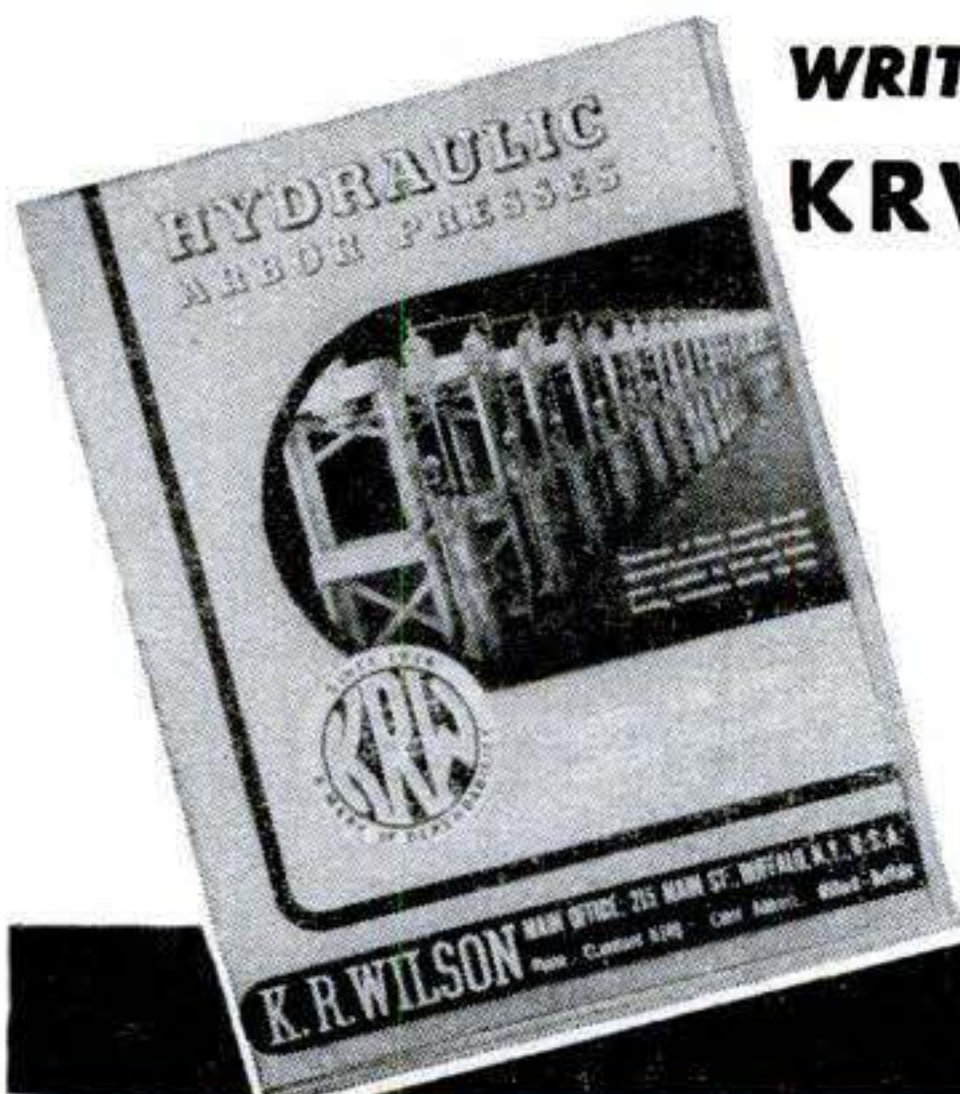
I was born on the _____ day of _____, 19 _____

Parent or guardian _____

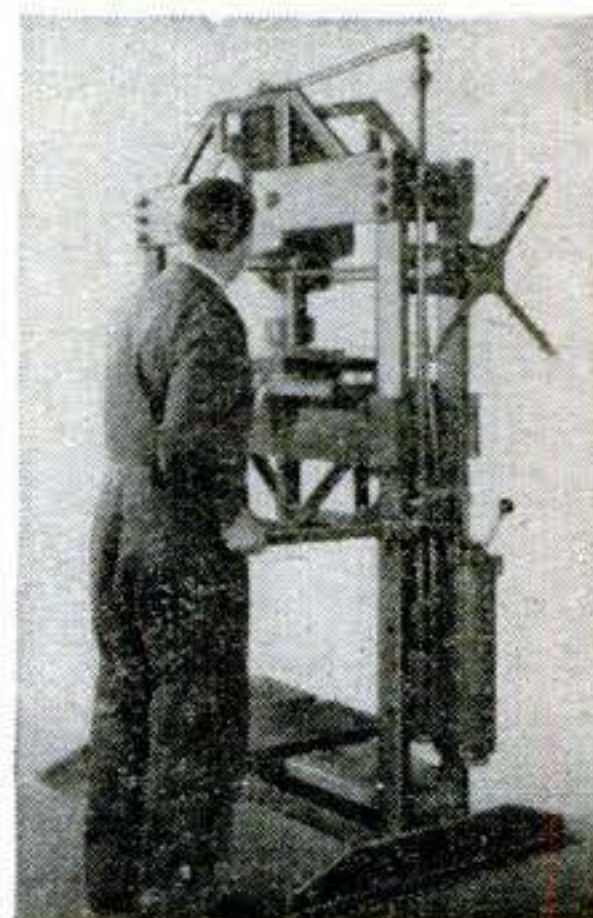
Name of school _____

City _____ State _____ Dept. 2-B

WRITE FOR YOUR FREE COPY OF THE NEW KRW HYDRAULIC PRESS BOOK



Describes all manner of Production and Shop Work on KRW Hydraulic and Bench Type Arbor Presses. 32 pages illustrating the new KRW Hand-operated, Electric-operated and Air-operated Hydraulic Presses. Write for your copy today.



K. R. WILSON, DEPT. 54, 215 MAIN ST., BUFFALO 3, N. Y.

SPEEDWAY 1/4" AC-DC DRILL

Put a sparkling finish on your car, boat, furniture, silverware, leather goods, etc. Simonize your car in half the usual time!

1000 R.P.M. with 6 foot line cord. As nationally advertised with one year factory guarantee.

\$11.80



POLISHER & SANDER

High Pile Lambswool Bonnet with 7" polishing surface on heavy-duty flexible rubber disc. Also includes sandpaper disc.

\$1.95

SPECIAL COMBINATION OFFER!

DRILL & POLISHER only \$12.65

10 pc. high-grade drill set from 1/16" to 1/4" with metal stand — \$2.25 extra.

COMPLETE PREPAID

SPEEDWAY BENCH GRINDER



One of the most popular grinders built! Check all these specifications: Speed 3400 RPM. Rating 1/15 Horsepower Intermittent Duty. Motor Shaded Pole AC. Grinding Wheels 4 1/2" x 3 1/2" x 3/8". Voltage 110-120AC. Length 8", Height 6". Self-aligning Bronze Bearings. Beautifully finished in blue crackle, complete with 2 grinding wheels, built-in thumb switch—installed near base, and 6 ft. rubber covered cord with unbreakable plug.

\$14.98

WE PAY POSTAGE—Send Check or Money Order Today—MONEY BACK GUARANTEE

FREE

Special Gift!



7 piece Slip-On Socket Set . . . sizes 1/4" to 7/16" . . . with the purchase of either the Bench Grinder or Grinder Kit. Regular Price \$4.30.

SPEEDWAY GRINDER KIT

Ideal for home craftsmen, mechanics, handy men, model makers, etc. Consists of powerful, all-purpose Speedway Grinder, with collets for 3/32" and for 1/8" arbors, and 16 selected rotary files, mounted stones, discs, brushes and wheels. It cuts, grinds, cleans and polishes . . . works in wood, metals, bone and plastics. Complete kit enclosed in beautiful, sturdy simulated leather box. Excellent for gifts!



Only \$13.98 complete

THE ORDER MART, Dept. P

62 Warren Street, N.Y.C. 7 • W04-3497

SERVICE STATION OWNERS



Don't let this happen to you!

USE "SAFETY-FILL" NOZZLE WITH AUTOMATIC CUT-OFF

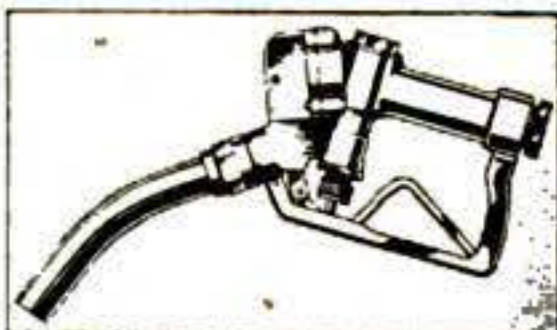
Follow the thousands operating service stations who are purchasing their own. Investigate! You will find many already in service in your locality. The same nozzle as advertised in Saturday Evening Post and other publications.

Customers are beginning to demand "SAFETY-FILL" service. It sells more fill-ups because:

CUTS OFF AUTOMATICALLY WHEN TANK IS FILLED

NO SPILLING, WASTING GASOLINE

Underwriters approved. Mail your order today. Price \$15.22. Prepaid nearest RR station. Send \$3.00 for each nozzle ordered. Balance C.O.D. **SALES AGENTS WANTED**



RICHMOND OIL EQUIPMENT CO., INC.

1419-21-23 E. MAIN ST.

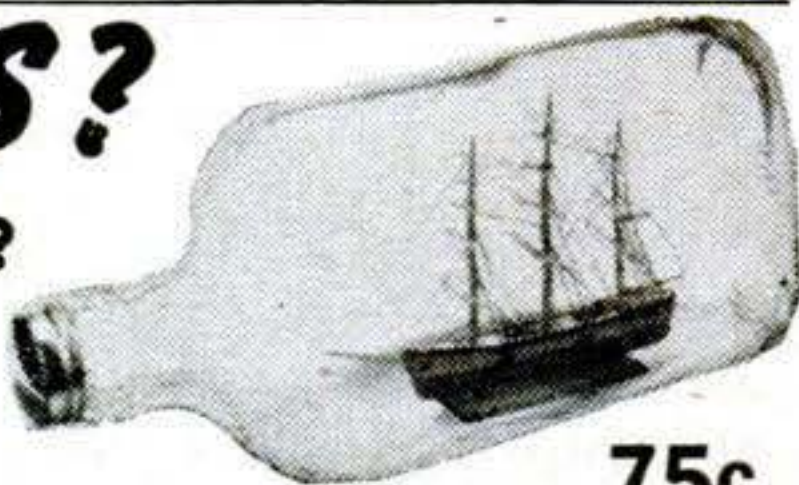
RICHMOND 19, VA.

CURIOUS?

About a

SHIP-IN-A-BOTTLE?

Here is the secret plus all of the material for only 75c postpaid, less bottle. Also send 10c for complete catalog and ask your dealer about this kit.



75c

Postpaid in U.S.A.

BRAUN-CRAFT 1232 Etowah, Dept. PS-11, ROYAL OAK, MICHIGAN

OTTAWA Buzz Master

A faster brush cutter and wood sawing machine. Propels itself while cutting saplings and brush. 7 H-P motor. Many outstanding and exclusive features. Available attachments: sickle bar, rotary tiller, sprayer, air compressor, snow plow and pulley for belt work. Thousands in use. Send for FREE booklet.

OTTAWA MFG. CO., 1-801 Brush Ave., Ottawa, Kansas



No Other Like It!

How to make Liquid Marble

Make amazing Liquid Synthetic Marble at home in your kitchen, basement or garage. Terrific demand! **BIG PROFIT!** No heat, pressure or machinery needed. No experience necessary. **MOLD, TROWEL or BRUSH**—make in almost any color.

FLEXIBLE MOLDS: Valuable information for novelty casting. 3c material makes \$1.00 item. **PERMA-TEX Plastic Flooring:** Make lifetime floors in any color or shade. Can be laid over wood, concrete, brick, etc. Work out beautiful patterns in contrasting and harmonious colors.

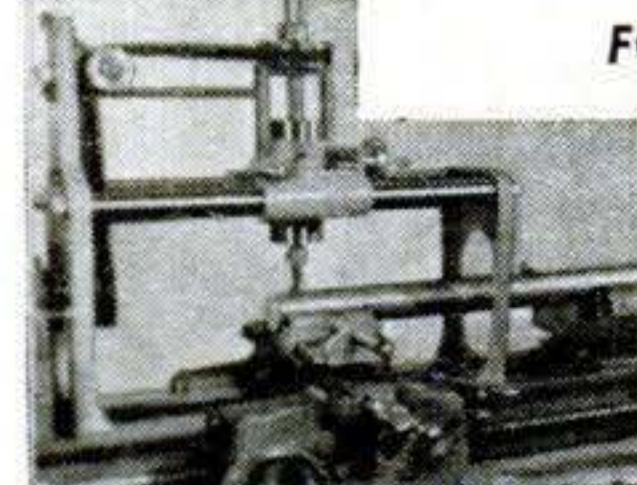
WRITE FOR FREE CATALOG!

BING PRODUCTS

Dept. PS-11B, 88 Broad St., Boston 10, Mass.

PALMER VERTICAL MILLING ATTACHMENT

FOR ANY BENCH LATHE



Quickly converts lathe to milling machine. Cuts, mills, and grinds. Complete: \$99.50.

Send for Bulletin 548.

PALMER INDUSTRIES

6151 So. Sangamon St. Chicago 21, Ill.

NEW! ROTARY SANDER

FOR DRILL PRESS OR ELECTRIC DRILL

No Gluing—No Special Discs

Uses 3" square of any paper. Change in one minute without messy gluing. $\frac{3}{8}$ " shank for drill press. $\frac{1}{4}$ " shank for electric drill. Specify size. Lamb's wool polishing bonnet \$1 extra. Write for literature on other time-saving tools.

MASTERCRAFT 60 SOUTH ST. BOSTON, MASS.



\$3.95

1/4-TON ARBOR PRESS

Ideal for straightening, bending, light stamping, riveting, staking, production assembly and general presswork. Used ten years in plants and shops—bushings, cameras, reels, typewriters, instruments, light molding, etc. Grey iron castings. Height 7 1/2"; over table 21 1/2"; over base 43 1/4"; ram 5 1/16" x 7 1/16"; ram travel 21 1/4"; approx. pressure 500 lb. Weight 7 lb.

See Your Dealer or Order Direct
\$9.50 POSTPAID U.S.A., MONEY-BACK GUARANTEE

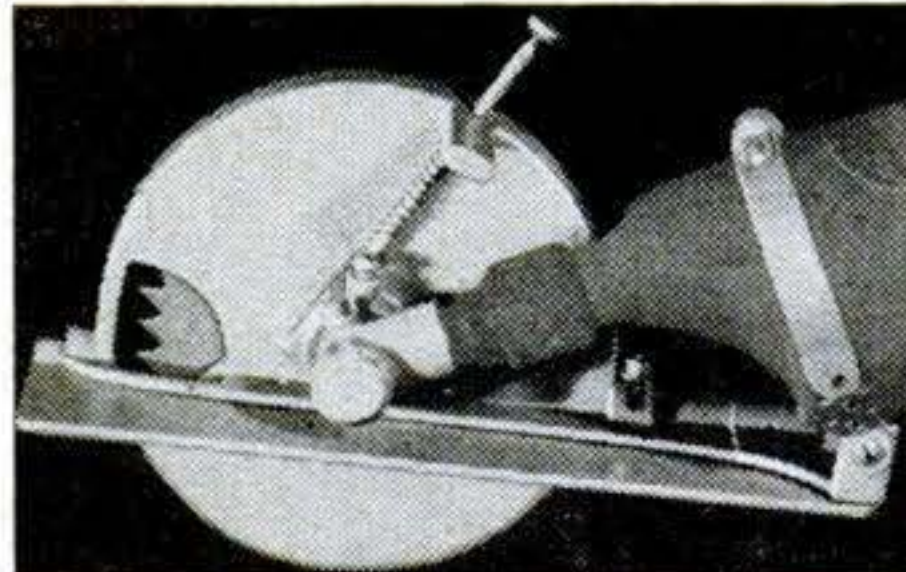
No C.O.D.'s, Please

H. D. HERDER, Tool Specialties
2423 Brook Dr. KALAMAZOO 82, MICH.



PORTABLE SAW

From Your Powerdrill



Lite-Saw converts standard 1/4" Drillmotor to 6" portable saw. Easy to attach. Rip, cross, bevel and cut-outs. Satisfaction guaranteed. \$24.50 complete, postpaid. Send check or money order to

FUTURE PRODUCTS CO.
3625e N. Mississippi PORTLAND 12, OREGON

See the IMPROVED SALSBUURY MOTOR SCOOTER

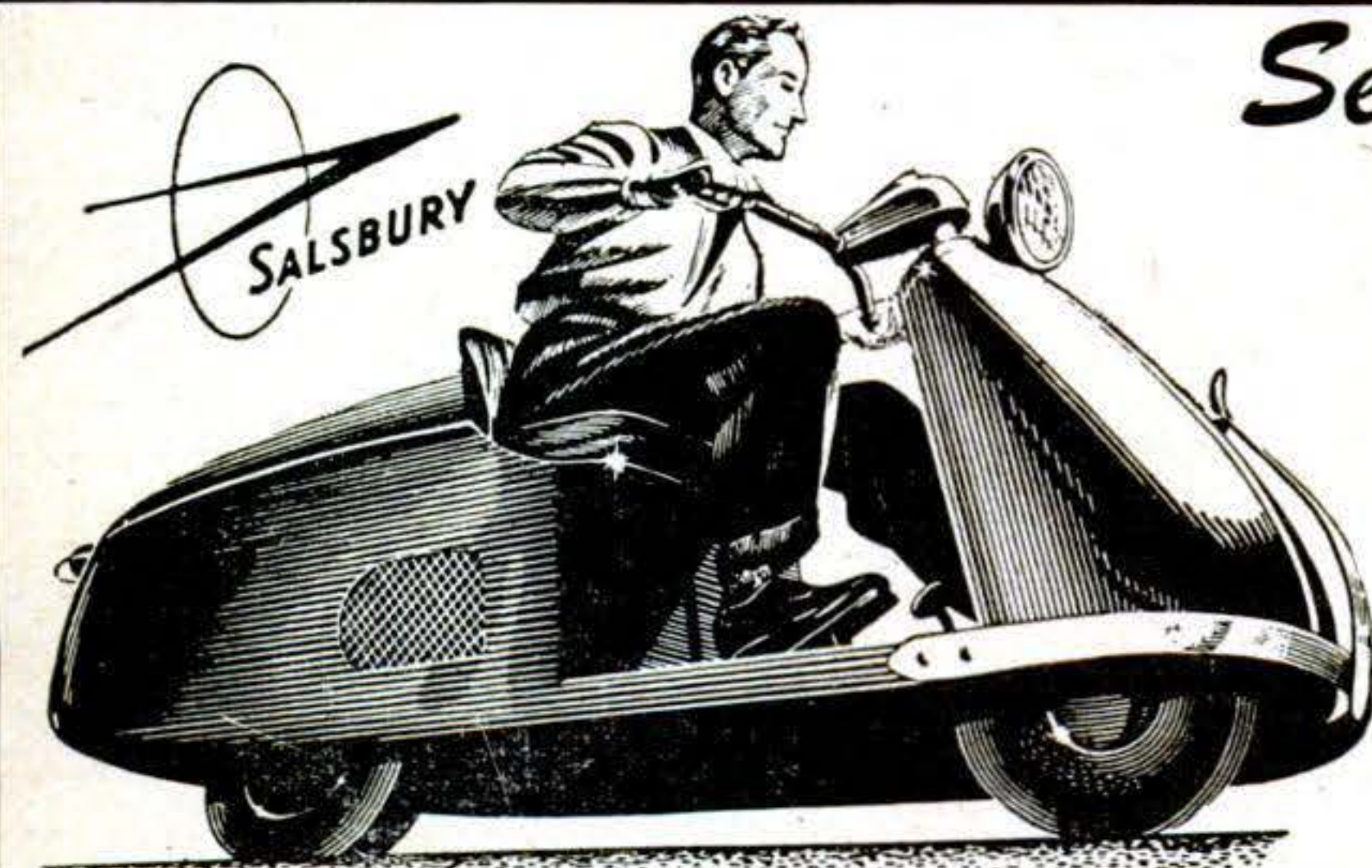
Dependable—6 H. P. Engine
Easy to Drive—Automatic Shift
65 or more miles to the gallon

Write for Free Folder

SALSBUURY MOTORS, INC.

Dept. PS-11

POMONA, CALIFORNIA





MOHAWK CHIEF

\$8.95

Glow Plug Model Less Plug \$7.50

● The highest quality miniature gas engine in the low-priced field. Now in either Spark Plug or Glow Plug models as priced above. Real steel 1-piece cylinder with deep fins. 1-piece crankshaft. Aluminum crankcase. Other outstanding features. For B-class—299 dis. 2-12,000 RPM. .760 bore. 660 Stroke. Wt. 7 oz. At your dealer's or order direct, adding 25c to above prices for handling. Or send \$1.00 and pay balance C.O.D. Every engine BLOCK TESTED & GUARANTEED.



SPITFIRE Coil and Lead — ONLY \$1.50

High output matched unit for Mohawk Chief Spark Ignition Engine.

MOHAWK ENGINEERING CO., 1411 Michigan St., Mohawk, N. Y.

Build YOUR OWN BOAT



Complete parts cut to exact size—ready to assemble. Marine waterproof plywood, rustproof oarlocks. Ideal for car top. Also models with laminated frames; mahogany decked runabouts. Build for sale at attractive profit. Exclusive franchise to local builders. Send 10 cents (dime) for illustrated literature.

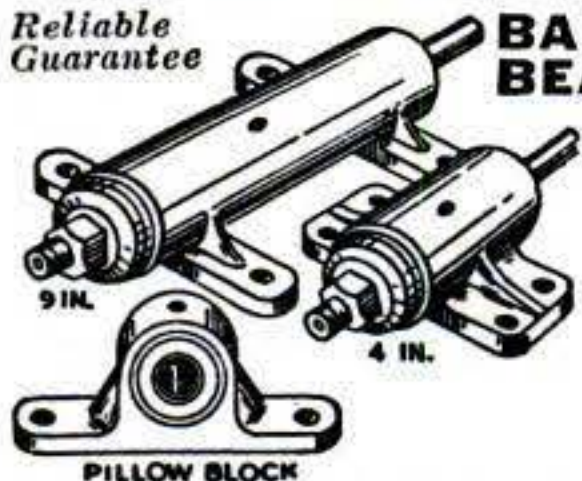
\$39.50
and up

OZARKA

763 WASHINGTON AVE.
WOODSTOCK, ILL.

BUILD YOUR OWN POWER TOOLS

Reliable
Guarantee



BALL BEARING ARBORS \$6.95

Rugged aluminum alloy housing, heavy duty sealed ball bearings, precision steel shaft 1/2", 5/8" or 3/4".

Housing	Overall	Price
2 1/4 x 4"	7 1/2"	\$6.95
2 1/4 x 9"	13"	7.95

BALL BEARING PILLOW BLOCKS

Sizes 5/8" and 3/4" \$3.00
Shipped immediately postpaid. Order now—you will be pleased.

O. V. HAWTHORNE TOOL CO., Dept. S, OTSEGO, MICH.

“PLASTICS”

Work in a fascinating and profitable hobby. Just out—our latest fabricating manual. Tells you how to work with Plastics. Our new Catalogue provides all needed materials: Plexiglas—Lucite—Tenite—Catalin—Acetate—all in sheets, rods, and tubes. Complete line of cements, dyes, accessories and supplies. Send 20c today for Catalogue and Handbook. No overseas shipments.

HOUSE OF PLASTICS

8648 Linwood Avenue, M. O. Dept., Detroit 6, Michigan

DRAINS CELLARS, WASH TRAYS CIRCULATES OIL

Pumps 1800 GPH 300 gal. 30' high, uses 1/8 to 1/3 HP motor. Will not clog. **\$6.50**

Postpaid if cash with order.
(Add 50c for west of the Mississippi.)

Thousands in use since 1936

LABAWCO PUMPS, BELLE MEAD 3, N. J.



Now . . . you can quickly and easily Modernize Tables, Sink Tops, etc., with POLATEX PLASTIC TOP

This decorative plastic laminate comes in hard, tough sheets 1/16 in. thick. Ideal for splash panels in kitchen or bathroom. Many other uses. Easily installed. Gives a smooth, sparkling surface . . . resistant to stains, abrasion, alcohol or cigarette burns. Beautiful red, tan or blue Linen patterns. Instructions for easy application included.

The same popular, durable surface you've seen on better restaurant and kitchen tables and cabinets where constant use is demanded.

Distributors wanted POLAMOLD PRODUCTS, Springfield, Ohio

Price per 36 x 40 Sheet **\$7.95** Shipped pre-paid (west of Rockies add 50c per sheet.)
Five or more sheets \$7.25 ea.
Send check or money order.



... with Casite in Your Car

● Casite gives you quick, snappy starts, right on time, every time. No matter how cold the weather, Casite retards congealing of oil, lets your motor spin and go.

And Casite keeps you going smoothly, steadily, powerfully—without spit or sputter, jerking or jumping.

You'll know a new thrill, a new satisfaction from your car. You'll know, too, your engine's getting extra protection, improved lubrication, and longer, brisker life—with Casite in the crankcase.

THE CASITE CORPORATION, HASTINGS, MICHIGAN
Casite Division, Hastings Ltd., Toronto

75¢ a pint

95¢ in
Canada

QUICK STARTING
IN COLDEST WEATHER
OR

Double-Your
Money Back



NEW PRODUCT
drouit

Prevents Gas-Line Freeze-Up
or Double-Your-Money-Back

QUALITY TILTING ARBOR SAW

FULL BALL-BEARING

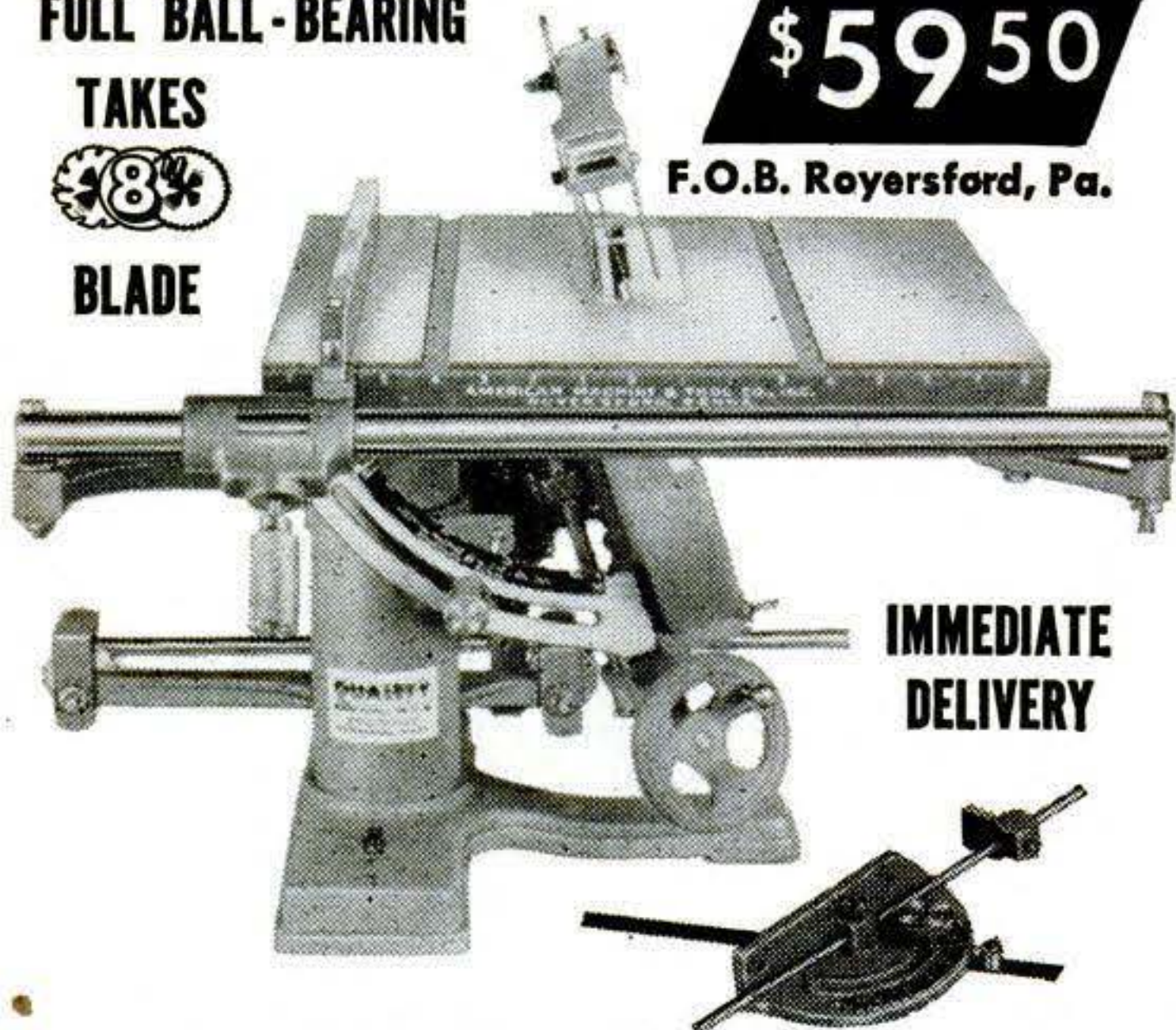
TAKES



BLADE

\$59.50

F.O.B. Royersford, Pa.



IMMEDIATE
DELIVERY

SAW BLADE TILTS • TABLE STAYS LEVEL

Send for catalogue showing complete line
of Tilting Table and Tilting Arbor Saws,
from \$24.95 to \$87.50

AMERICAN MACHINE & TOOL CO., Inc.
ROYERSFORD, PA. DEPT. 200



**BUILD YOUR OWN
2500 WATT ELECTRIC**

**LIGHT
PLANT**

All you need is an electric generator; a small engine to drive generator at proper speed; 2 dual sheaves; 2 V-belts; and a welded angle iron base. No wiring is involved, and you do not need to know anything about electricity to make this assembly.

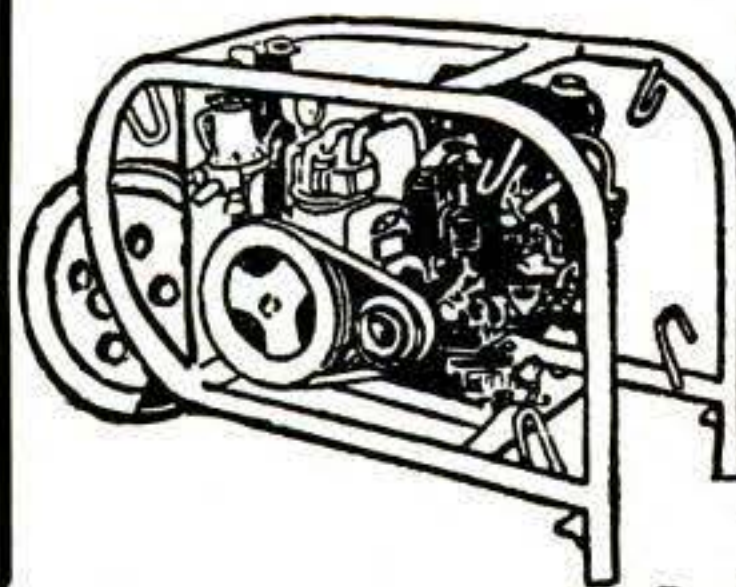
Start out by buying the 2.5 KVA Leland Alternator shown above. It is a 120 volt, 60 cycle, single phase, A.C. generator, complete with radio filter box, and self regulating voltage. It must turn at 1800 r.p.m. for bright, even lighting. Requires 3 3/4 H.P. to turn generator at full load—so buy an engine of at least 6 H.P. to have plenty of reserve.

We will ship you the GENERATOR ONLY, without pulley or belts, for \$125.00 freight prepaid. If your needs are urgent, we will assemble your set, using above generator and a 6 H.P. Salsbury gasoline engine, manually started, governor controlled, and ship to you \$297.00 freight prepaid. Same unit but with Ensign conversion to run on natural gas \$347.50 freight prepaid.

To eliminate time lapse for personal checks to clear, we suggest remittance by bank draft or cashiers check.

HOPFER & COMPANY
3122 EAST 14TH STREET, OAKLAND, CALIFORNIA

AIR COMPRESSORS



Bendix - Westinghouse

Original cost approx. \$260

SALE PRICE **\$59.50** Less Engine

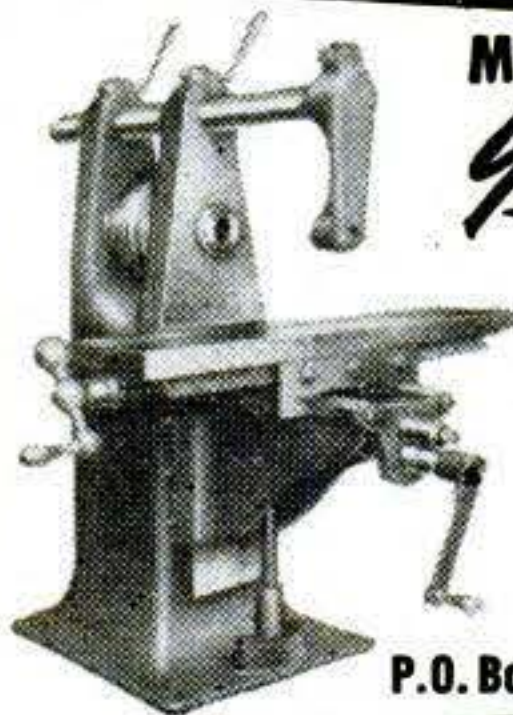
Write for illustrated circular giving full particulars

The Original

Midwest Buy Anything Company

Not connected with any other firms of similar names

Dept. S, 1520 Locust, Kansas City, Mo.



Make This MILLING MACHINE
Yourselves From low-cost
LEWIS CASTINGS!

MILLS SLOTS, keyways, dovetails, flat surfaces, etc., in all types of metals. Castings sold rough or semi-finished. Comparable to similar commercially-built machines in quality and capacity. WRITE FOR FREE CATALOG describing many LEWIS Power Tool Castings and Projects!

LEWIS MACHINE TOOL COMPANY

P.O. Box 7446, Sta. L, Dept. S, Los Angeles 23, Calif.

BUILD ARC WELDER

FROM OLD GENERATOR

For Light or Heavy Work. 75-200 amps. No previous experience needed. Complete PLANS and valuable Catalog 35c.

LEJAY MANUFACTURING CO.
1323 LeJay Bldg., Minneapolis 8, Minn.

**BUILD YOUR OWN
FAST FREEZER**

PLANS
\$1

It's easy to build this household appliance with LeJay Plans. Made from new or used parts. Save up to 75%. No expert knowledge needed. Plans show 5 sizes and are easy to follow. All details clearly explained. Enjoy making one of these freezers. Mail \$1 for set of plans and catalog. LEJAY MFG. CO., 423 LeJay Bldg., Minneapolis 8, Minnesota



5 sizes
8 to 40 cu.ft.

Amazing FOUNTAIN PEN GUN

Shoots Tear Gas 15 Feet

Fits Pocket or Purse...

Guaranteed
to stop man
or beast



Complete Protection
With Just a Flick
of Your Finger

Here's quick, easy "finger-tip" protection. Shaped like a regular fountain pen, this pistol pen throws a powerful charge of tear gas 15 FEET! Cloud of gas spreads 4 to 6 feet. You can't miss. Just point pen like you point finger and release trigger. Ideal for home, office or car. May be clipped in pocket like pen. Loads

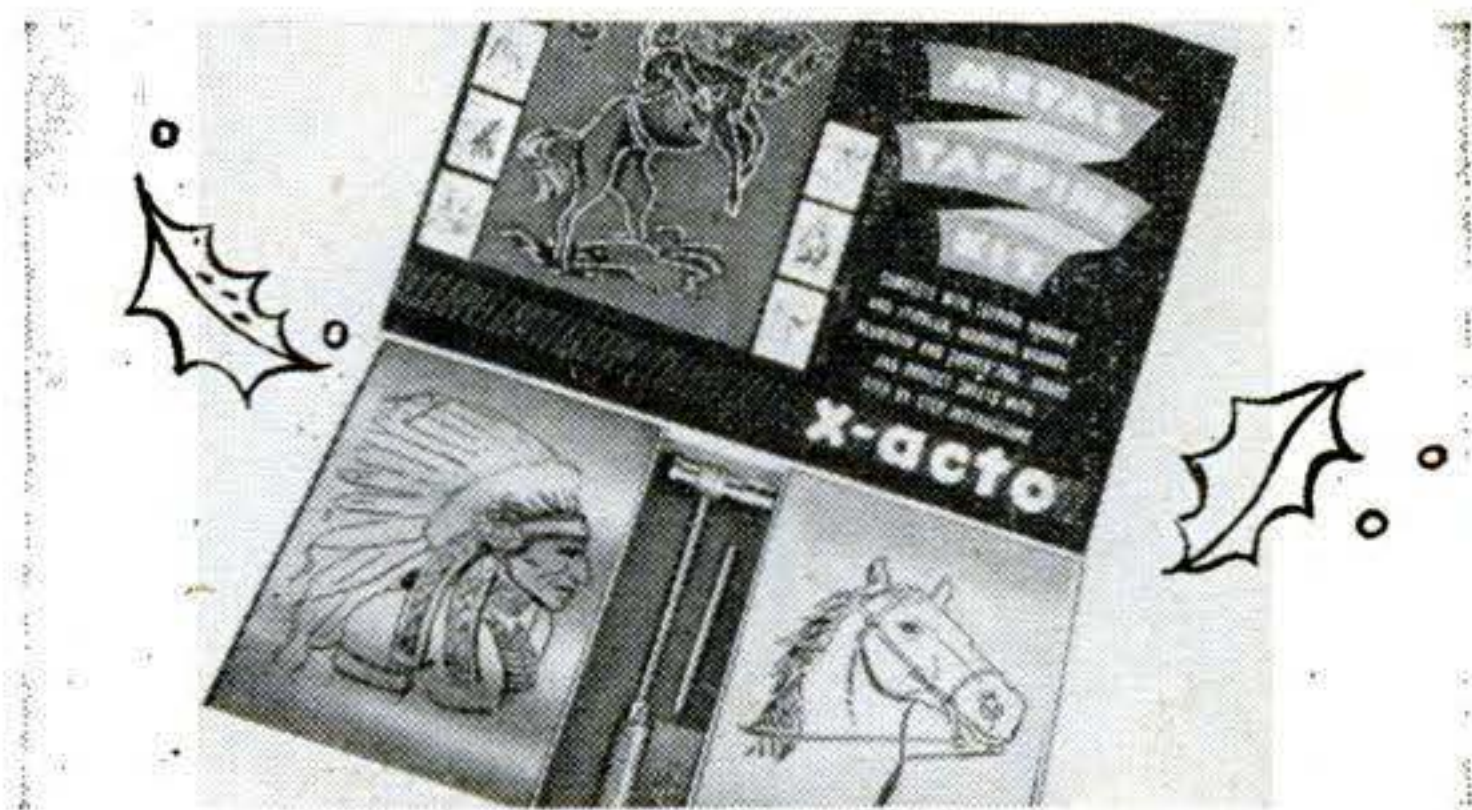
like gun. Fires 38 Caliber S. & W. "Special" TEAR GAS cartridge. Will not kill. Renders mad dogs, robbers, etc., helpless. Can not harm user. Effective indoors or out. NOT SOLD TO MINORS or persons residing in state prohibiting sale of firearms. ONLY \$7.50. Cartridges 5 for \$2.50. Order TODAY!

SEND NO MONEY Just send name and address. Specify Pen, Cartridges or both. On arrival pay cost plus Express Shipping charges. Send cash with order, we pay express charges. Use 10 days. If not delighted return for money back. Order NOW!

DEFENDO PRODUCTS CO. Dept. 454, 215 N. Michigan Ave. Chicago 1, Ill.

IF YOU WANT TO MAKE A HIT—

Give an X-acto Kit!



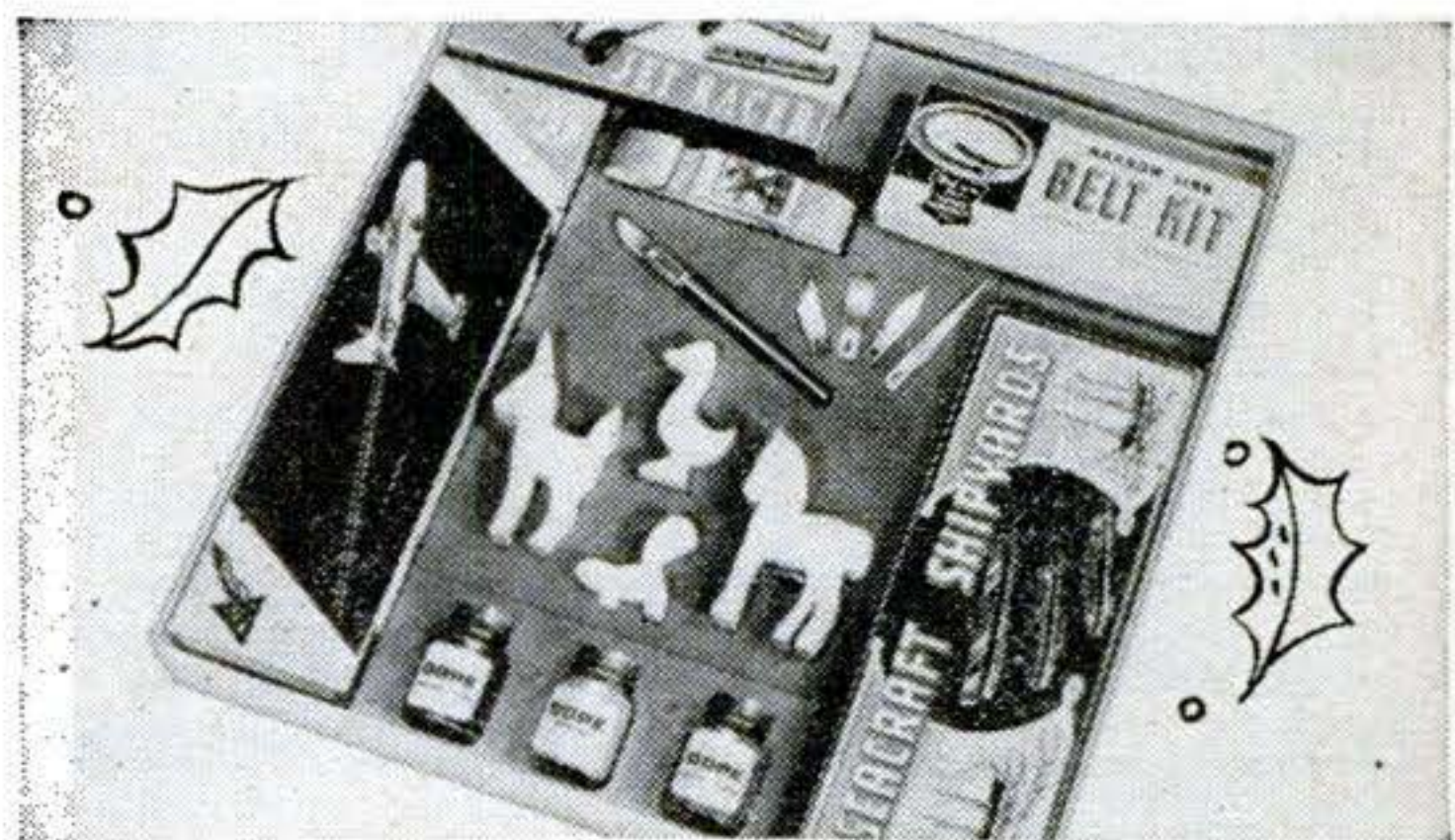
NO. 470 X-ACTO METAL TAPPING KIT

New! Contains tapping hammer and stippler, mounting boards, aluminum and copper foil with printed project, brads and instruction sheet. A fascinating hobbycraft! . . . **\$1.50**



NO. 86 X-ACTO HOBBY CHEST

Ideal for modelbuilders, whittlers, woodcarvers, etc. Contains 3 knives, planer, sander, balsa stripper, spokeshaver, assorted blades, routers, gouges, punches. How about Dad? **\$10.00**



NO. 450 X-ACTO 5-IN-1 KIT

Material and complete instructions for leathercraft project, model plane and boat, 4 whittling blocks, jet car; knife, blades, sanding block, dope paint. Teen-agers love it! **\$4.95**

Here are just four of the dozens of X-acto kits and sets that will bring joy to the heart of beginner or expert hobby crafter. The handicraft kits each contain a complete project, plus all the tools and materials needed, and easy-to-follow instructions for turning out a finished job. X-acto refill-blade knives and specially designed hobby tools, in a wide range of sets and prices, provide the "dream gift" for hobby crafters of every age and taste. See the complete line at your hobby, art, gift, hardware or department store. Singly or in sets from 50¢ to \$50. (Prices slightly higher in Canada.)

X-acto

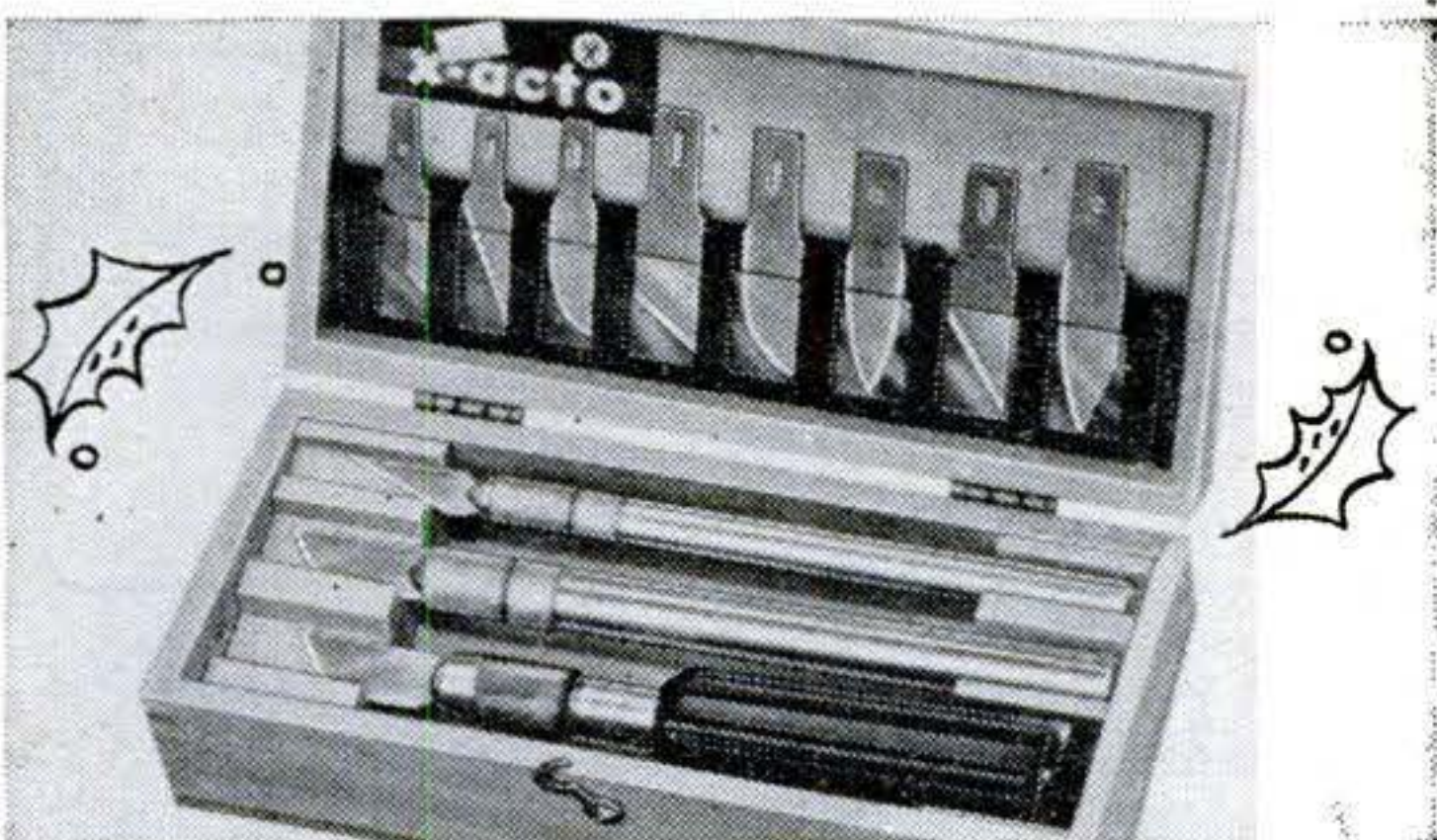


HANDICRAFT KNIVES & TOOLS

X-acto Crescent Products Co., Inc., 440 Fourth Ave., N. Y. 16

In Canada: Handicraft Tools, Ltd., Hermant Bldg., Toronto

*Reg. U. S. Pat. Off.

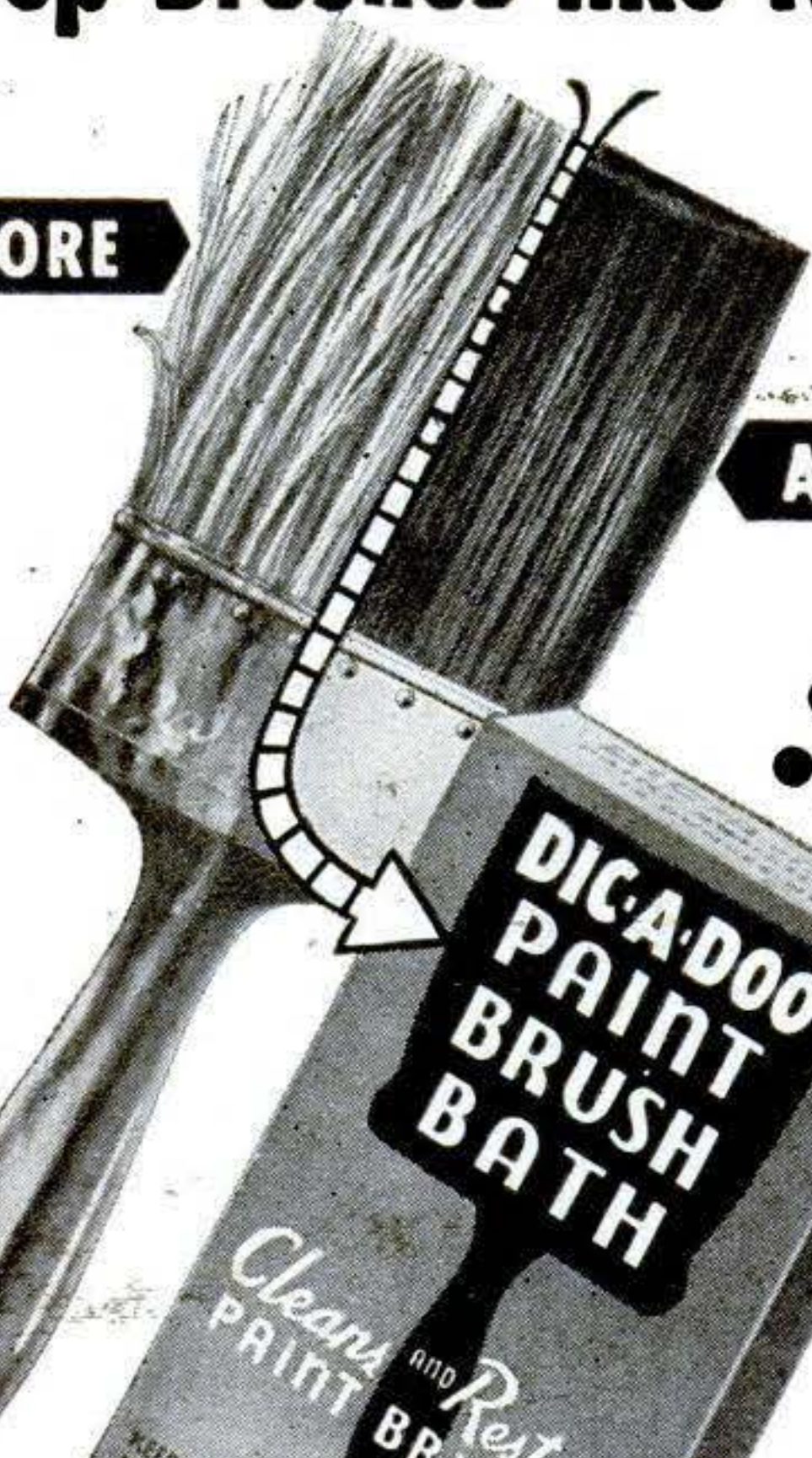


NO. 82 X-ACTO KNIFE CHEST

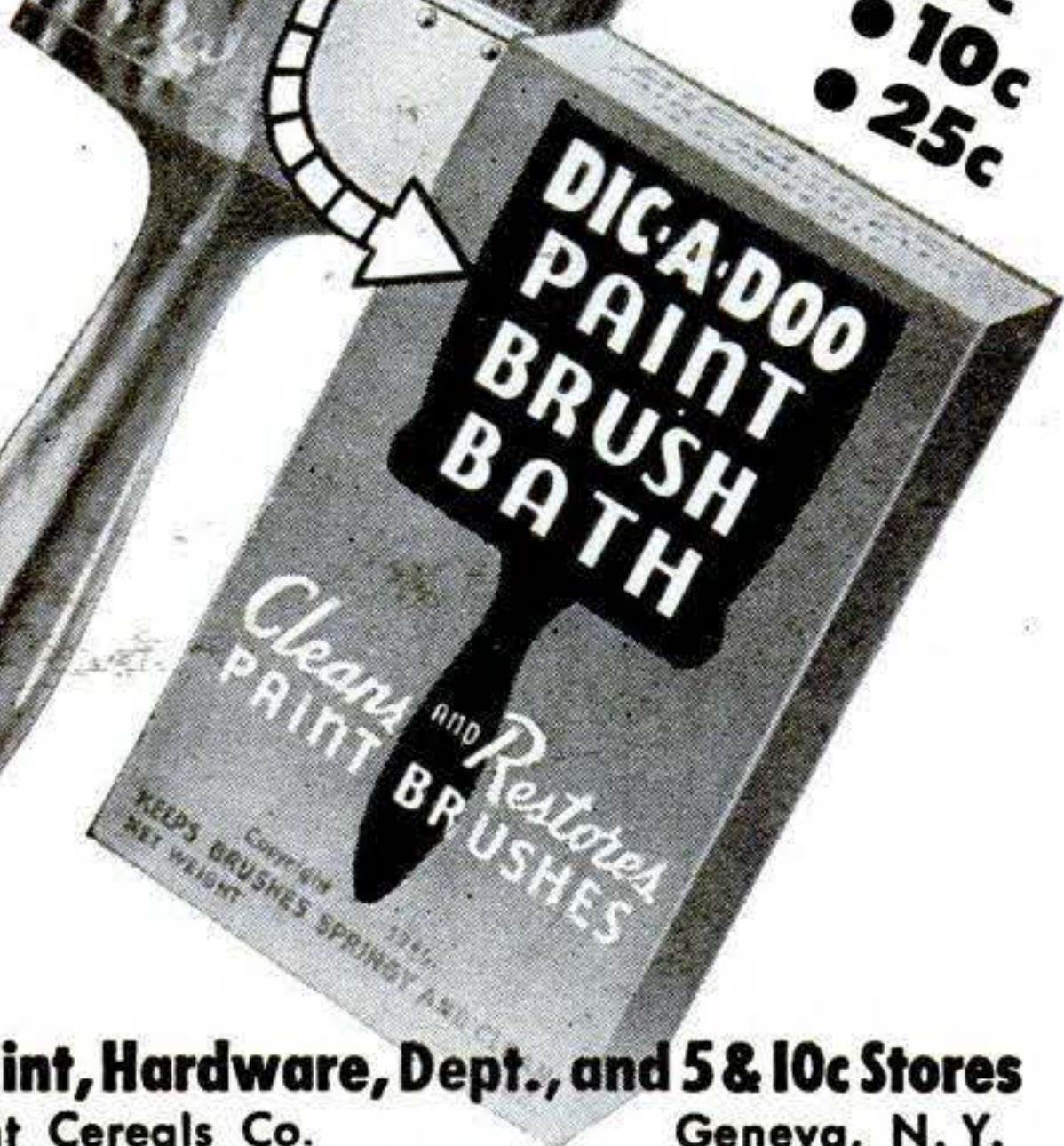
Perfect set-up for beginners, helps them turn out fine-looking jobs. Designed for safety and sure control. Contains 3 knives, assortment of super-sharp extra blades. In wooden chest. **\$3.50**

Keep Brushes like New

BEFORE



AFTER



DICADOO PAINT BRUSH BATH

Clean and Restores PAINT BRUSHES

Helps brushes spring and retain weight

• 5c
• 10c
• 25c

At Paint, Hardware, Dept., and 5 & 10c Stores
Patent Cereals Co. Geneva, N. Y.



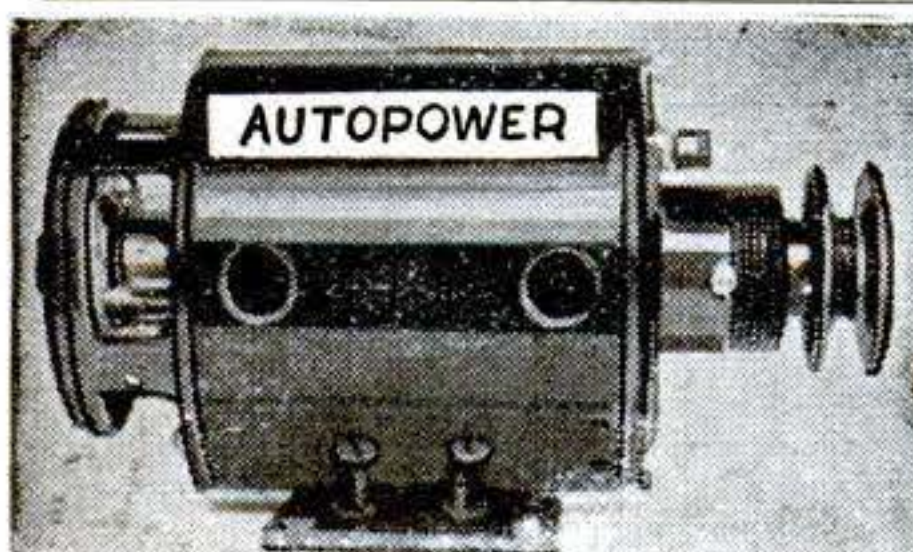
1-minute angle set-ups!
Tilt it for the angle and lock it. You're set up for any operation, machine or bench. Two sizes, 2" and 2 3/4" jaws, with or without swivel base. Write for Vise

Folder and "Yankee" Tool Book.

YANKEE TOOLS NOW PART OF

STANLEY

THE TOOL BOX OF THE WORLD
NORTH BROS. MFG. CO.
Philadelphia 33, Pa.



TURN SCRAP INTO MONEY

AUTOPOWER tells you how in plain, easy, simple, and illustrated instructions that anyone can follow. Change auto generators into useful, practical AC and DC generators and motors with voltage from 2 to 1,000 volts, for power, light, welding, radio, sound, etc. No previous experience nor special tools needed. Generators can be driven by wind, water, fan belt, etc. Already used and endorsed by thousands. Send for your copy of "AUTOPOWER." Only \$1.00 postpaid.

AUTOPOWER INC., 918 South Theresa St., St. Louis 3, Mo.



WORLD'S LOWEST PRICED ADDING MACHINE

VEST POCKET SIZE THE IDEAL XMAS GIFT!

FREE TRIAL
ONLY \$2.95

TOTAL COST
SEND NO MONEY

FREE!!

Each Baby Calculator in Beautiful, rich-looking Leatherette case—at no extra cost.



Fits vest pocket or purse. Guaranteed accurate. Operated as easily, and as reliable, as machines costing many times as much. Not a toy. Precision made, very durable—guaranteed for life against defects in construction. You positively can't buy a calculator of equal quality for as little money. **ACCEPTED AS THE FINEST LOW PRICED CALCULATOR FOR OVER 35 YEARS!** Operates with a flick of your finger. Adds, subtracts, multiplies, divides—counts up to one billion. Pays for itself over and over in mistakes avoided, and time saved.

MAKES IDEAL GIFT

Sold on a positive money back guarantee. Send only \$2.95. Calculator sent postpaid, or send name and address and pay postman \$2.95 plus postage. **MONEY BACK IN 10 DAYS IF NOT DELIGHTED!** (If outside U. S., send \$3.50.)

AGENTS WANTED

CALCULATOR MACHINE CO., (Mfrs.)
Dept. 506, P. O. Box 248, Glenview, Illinois

GENUINE DIAMOND SCRIBER!



WRITES ON GLASS, METALS, PLASTICS

Never before at this price! Finest diamonds specially selected for cutting qualities. Set in hexagonal aluminum handle 6" long, by patented "Perma-Grip" method. Scribes or etches on glass, metals, plastics. Every scriber tested. Money back guarantee. Made by Clipper, foremost New York diamond tool manufacturer.

Agent and dealer inquiries invited.

CLIPPER DIAMOND TOOL CO., INC.
21-A WEST 46 STREET, NEW YORK 19

No C.O.D.'s. Send cash, M.O., or check.

\$2.00
Postpaid



Say You Saw It In Popular Science

SAVE ON HOUSE PLANS
ORDER FROM OUR ENLARGED

HOUSE PLAN BOOK

Complete construction blueprints available in Frame or Concrete block construction. Send 50c for Plan Book.

BROWN & TREADWAY
Architect Civil Engineer

2412 West Seventh St.

Los Angeles 5

A NEW KIND OF MOTORCYCLING WITH



SAFE-COMFORTABLE-POWERFUL

Automatic Clutch. Telefloat Spring Suspension.
Foot Gear Shift. 95 miles per gallon. 70 Miles per hour.
See and drive it at your nearest JAWA DEALER or
write for free folder.

JAWA MOTORCYCLE CO.

Dept. S,

460 FOURTH AVE., NEW YORK 16, N. Y.

DEALER INQUIRIES INVITED

The SEAMAN ROTARY TILLER is a Many-Job Farm Machine!



You can use a Seaman Tiller for:

- Complete Seedbed Preparation
- Pasture Renovation
- Aerating Soil
- Weed Eradication
- Mixing in Cover Crops
- Orchard Cultivation
- Better Moisture Control
- Mixing in Fertilizer
- Light Brush Removal
- Working Sod
- Erosion Control
- Nursery Work

In addition, the motorized models can now be adapted to Irrigation Service simply by attaching a Centrifugal Pump to the Tiller Power-take-off. Belt Pulley Attachment for motorized models also available for year-round power service.

Ask your dealer about SEAMAN ROTARY TILLERS, and write for your copy of Bulletin NST, just off the press! It tells about many interesting farm service applications and new, outstanding improvements. Motorized and power-take-off models, 3-ft. to 7-ft. tillage widths.

SEAMAN MOTORS, INC.

365 NO. 25TH ST.

MILWAUKEE 3, WISCONSIN

Worth a *King's Ransom* at a time like this...



Be prepared for such emergencies this winter by having two flashlights in your car with *fresh, new* Winchester No. 1511 batteries.



NEW!
DIFFERENT!
BETTER!

They Last Almost TWICE as Long* Yet Still Cost Only a Dime

*Measured by the A. S. A. light industrial flashlight test... the most effective test applicable to modern everyday use of this size battery... the *new* Winchester No. 1511 flashlight batteries LAST ALMOST TWICE AS LONG as the pre-war No. 1511. Reason? Olin electronic research has stepped up the power of their light-making chemicals.

You still pay only a dime for them—and they are guaranteed to give extra long life not only in flashlights but also in *any* equipment using regular flashlight cell size batteries.

Be Prepared For Night-time Emergencies

ONLY
\$1.65

EACH COMPLETE WITH FRESH
WINCHESTER NO. 1511
BATTERIES



They may overtake you at any time. Go to your dealer today and buy 2 new No. 6410 Winchester Deluxe Dual-Purpose Spotlights for your car or home. Each spotlight is 2 lights in 1—WHITE for safety... RED for danger. Made from solid brass, chrome plated with red translucent lens ring. Two spotlights cost only \$3.30 complete with batteries—isn't that a small price to pay for freedom from fear and worry when night-time emergencies arise?

WINCHESTER
TRADE-MARK



WORLD'S FINEST FLASHLIGHTS AND BATTERIES
OLIN INDUSTRIES, INC., Electrical Division,
New Haven, Conn.

ONLY *Royalton* 

FILTERWELL

has All Three

- 1 Economy Price **\$1**
- 2 Ajustomatic* Stem
- 3 Imported Briar

**Patented*

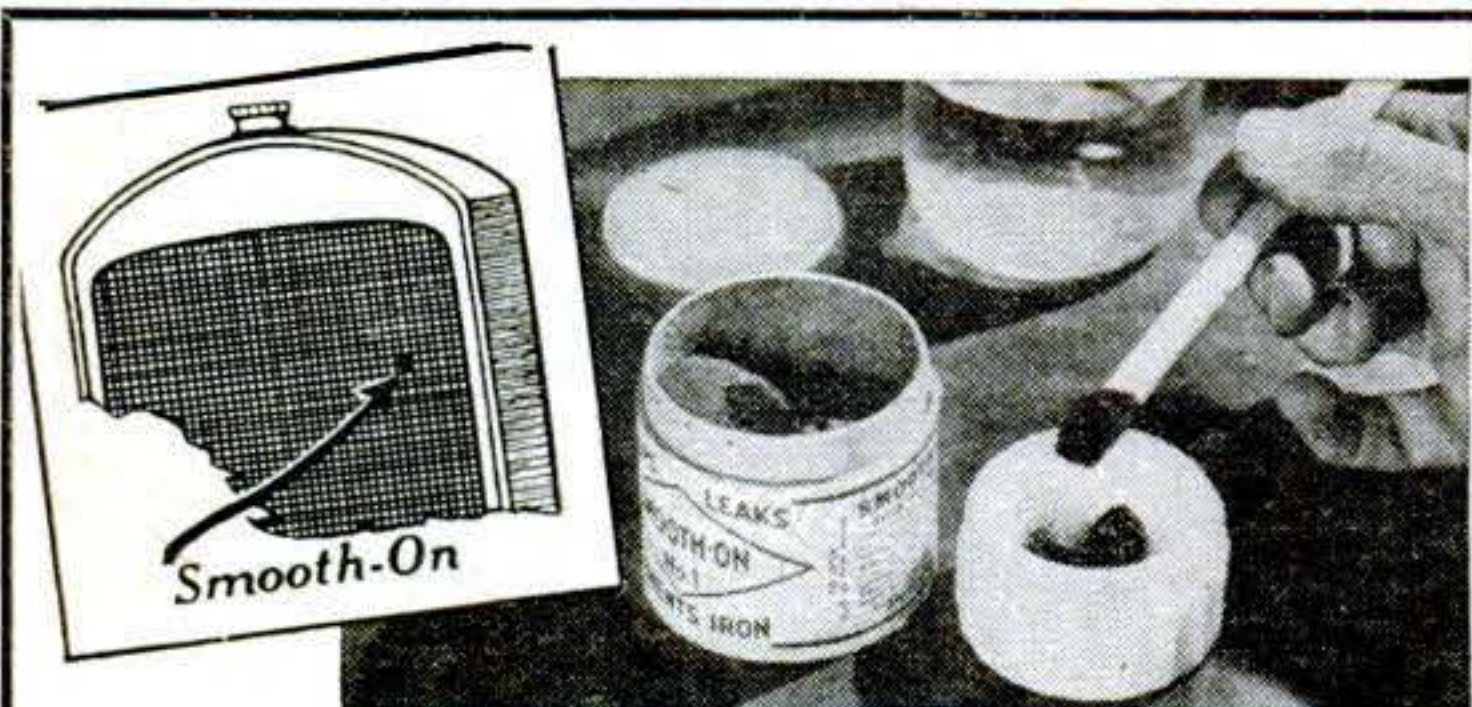
AJUSTOMATIC STEM NEVER LOCKS OUT OF LINE

FILTER ABSORBS TARS & JUICES

Before you buy your next pipe check all features of the Royalton Filterwell: patented Ajustomatic screw-stem, plus fine imported briar in a filter pipe at \$1.00... Luxury smoking at amazingly low price!

All Royalton Pipes have the Ajustomatic Stem

At leading stores. If unavailable locally write to
HENRY LEONARD & THOMAS, INC. OZONE PARK 17, N. Y.

When Your Radiator Springs a Leak...

Keep Smooth-On No. 1 Iron Cement handy for emergency auto repairs. Use it to stop radiator leaks; seal cracks in water jackets, crank or gear cases; tighten loose door hinges, handles, etc. You can save time and money making these repairs yourself. And they'll stay tight, for Smooth-On expands a little as it hardens. Buy Smooth-On in 1 $\frac{3}{4}$ -oz., 7-oz., or 1-lb. size at your hardware store. If they haven't Smooth-On, write us.

FREE Repair Handbook

This famous 40-page book shows, as well as the above repairs, many other useful ones you can make around the house. 170 pictures. Send postcard for YOUR free copy today.

SMOOTH-ON MFG. CO., Dept. 58L,
570 Communipaw Ave., Jersey City 4, N. J.

Do it with
SMOOTH-ON

THE IRON CEMENT OF 1000 USES



EARN A STEADY INCOME

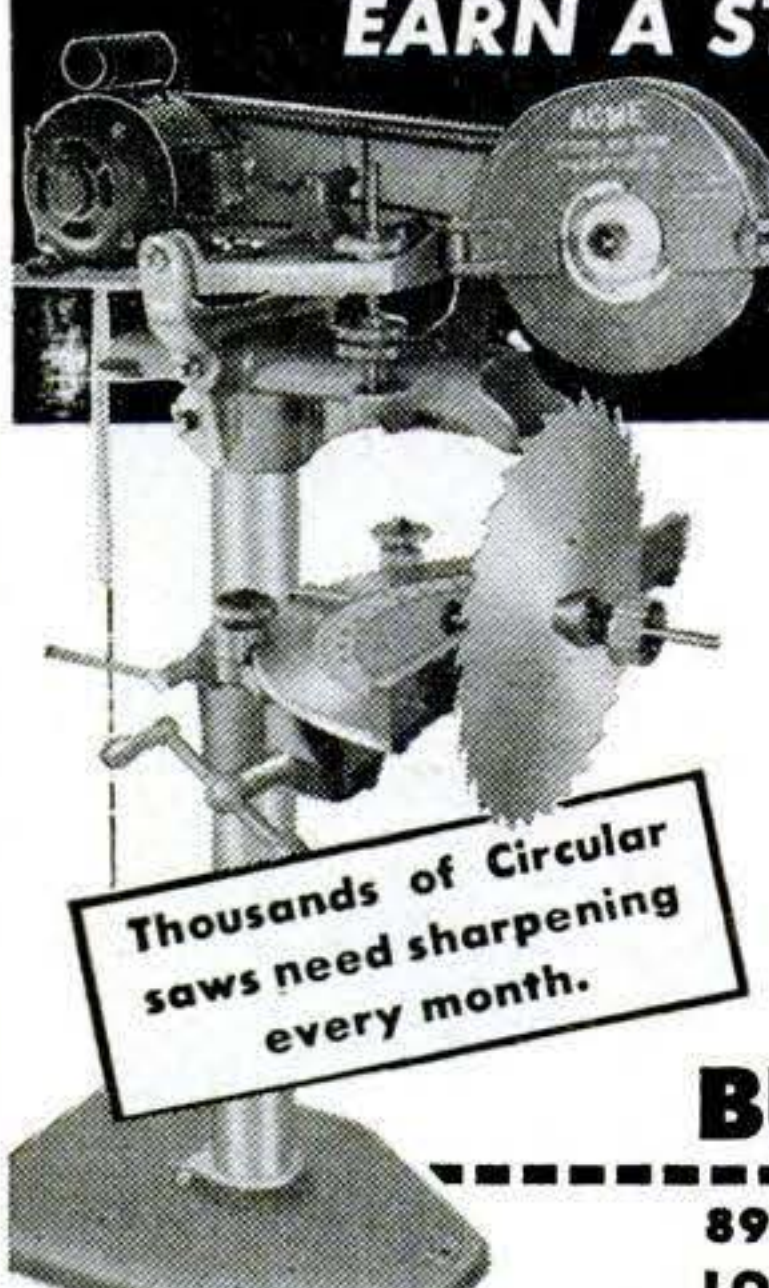
Sharpen CIRCULAR SAWS

Improved Acme Circular Saw Sharpener sharpens saws 6" to 60" Rip, Cross-cut, Combination, Dado, even planer knives. Easy to operate, accurate—fast—safe. Bevels 45°, Gums, Joints. • You can profit with this machine.

Write for details.

BURR MFG. CO.
8939-A VENICE BOULEVARD
LOS ANGELES 34, CALIFORNIA

Thousands of Circular saws need sharpening every month.



A Sensational Value! Complete Sanding and Polishing Kit

ONLY \$2.95

Will Fit Any $\frac{1}{4}$ -Inch Size Electric Chuck

Drill, Polish and Sand Combinations:

Black & Decker Home Utility $\frac{1}{4}$ " Drill with Kit... **21.90**
Speedway Blue Line No. 69 $\frac{1}{4}$ " Drill with Kit... **14.75**

Set includes two 5" flexible rubber discs, one 6" polishing bonnet, rubber cement, sand paper and instructions. Ideal for workshop or home. A good gift idea. Dealers Invited.

Order Now! We pay all mailing charges with Money Order or Check. Postage extra with C.O.D.

NEDRO SALES CO., Dept. PS-3 102 N. 11th St., Phila, Pa.



ASSEMBLE King Midget

Highway runabout. Low cost. 45 miles per hour. 90 miles per gallon. Just bolt together our factory built units. See how easy it is. Send \$1 (refunded first order) for 24 page assembly book with blueprints, drawings, photos. PLUS detailed illustrated circular.

Circular only—25c.

MIDGET MOTORS *Athens, Ohio*

SAFE ●
PRACTICAL ●
ECONOMICAL ●



Crosman TARGET PISTOLS

.177 or .22 Cal.

NOW you can shoot indoors as well as outdoors, for Crosman adjustable "power without powder" is safe, and there's no noise or powder reek. Fine balance, rifled barrel, push-type safety, adjustable rear sight; grip fits either hand. Only \$14.95! At your dealer's; write for literature.

Crosman Arms Co., Inc.

9 HENRIETTA STREET
ROCHESTER 7, N. Y.



FREE TRAINING in **Auto Mechanics Plus good pay while learning**



Become a first-class automotive mechanic and you're set for life... sure of a good job or able to run a shop of your own. Here's your chance to learn this valuable trade and the training won't cost you a penny. In addition, you'll get good pay while learning. The United States Army is offering this outstanding opportunity to a limited number of young men who have high school diplomas, or state certificates to show equivalent education. Under the new Army plan, you can sign up for the automotive school and be sure of enrollment immediately after basic training.

In the Army trade schools you'll be taught by experts, with equipment that

is the very latest in the automotive field. These schools are the finest in the world. So good that many colleges and trade schools give credit for work done in them.

Your pay starts immediately. You'll get \$75 a month, plus free food and housing... free clothing and equipment... free medical and dental care... free retirement plan... low-cost insurance. In all, the pay is equal to \$211.50 in civilian life.

You owe it to your future to get details on this opportunity today.

You can get the facts, without obligation, at the nearest U. S. Army Recruiting station.

INTERESTED IN SOME OTHER TRADE?

Automotive Mechanics is only one of more than 60 U. S. Army trade schools open to qualified young men. Ask your Recruiting Officer about any trade in which you are interested. Chances are he can offer you what you want.



SAVE TIME AND WORK! **MAKE EXTRA MONEY!**

EASY TO OPERATE

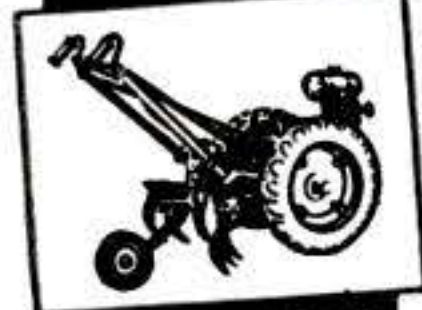


SHAW "DU-ALL" and "PEPPY PAL" GARDEN TRACTORS

PLOW



HARROW



CULTIVATE



MOW



RIDE



AW-2

SHAW MFG. CO.

These sturdy walking and riding tractors ideal for dozens of uses around the farm, orchard, garden, golf course, estate and poultry farm.

DO DOZENS OF JOBS
Shaw Du-All or Peppy-Pal tractors do many jobs quickly and easily. Plow, cultivate, harrow, mow, disk, bulldoze, spray, grind, haul and saw wood. New uses discovered every day.

BUILT FOR RUGGED WORK
Sturdy, extra-strength construction means low upkeep, long life. Patented tool control allows quick shift for crooked rows. Attachments easy to change with new "Jiffy Hitch."

CHEAP TO OPERATE
Operates on few cents an hour. Soon pays for itself in time and labor-saving plus low initial and operating costs.

LOW FACTORY PRICES
Buy direct or through your dealer! Almost anyone who has a garden can afford a Shaw Du-All or Peppy-Pal. Full year's guarantee.

RIDING TRACTORS
Four models, from 5 to 12½ H.P., 58 in. wheelbase, 38 in. wide, 24 in. plant clearance. Hand or electric starter. Improved steering device, brakes enclosed in differential housing shaft. Standard hitch for trailers and wagons. Plow, harrow, cultivator, cutter bar, snow plow, bulldozer available.

PROMPT SHIPMENT
No waiting—order now for immediate delivery.

FREE: Illustrated folders giving complete details and price lists. Write today:

5711 Front St., GALESBURG, KAN.
668PS North 4th St., COLUMBUS, O.

IT'S NEW **Water Cooled PIPE FOR THE SMOKE OF YOUR LIFE**



IT'S COOL! • IT'S DIFFERENT!

Here is the supreme thrill in smoking delight. Inspired by the water-cooled pipes used in the Orient, you'll notice at once how cool and clean the smoke tastes when it reaches your mouth. Made of sweet-smoking aged imported briar fitted with small glass vial to water cool and filter smoke.

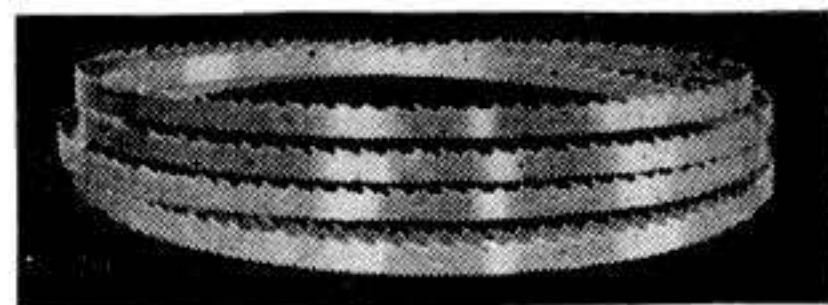
Also available in Natural Smooth Finish **\$3.50**

Remit with order, postage paid or C.O.D. plus postage.

PORTER Products, Dept. 16, 1472 Broadway, New York 18, N.Y.

Electrically Welded Endless
Paramount

BAND SAW BLADES



Made in widths from 1/8" to 1-3/4"

Make your band saw do more work for you. The proper width of blade will extend the scope of this important machine. Burrill's Paramount Blades are made from tough Nickel Alloy Steel properly tempered. Teeth accurately set and filed, and all saws carefully straightened. Send order and check today. Delivery will be made as promptly as conditions permit, from a few days to a week or two. You can obtain these saws at the following prices:

1/8"-3/16"-1/4"-3/8" wide, 5'6" long.....\$1.04 each
1/8"-3/16"-1/4"-3/8" wide, 6'6" long.....\$1.16 each
1/8"-3/16"-1/4"-3/8" wide, 7'6" long.....\$1.27 each

Other sizes at proportional prices

NO C.O.D. SHIPMENTS ACCEPTED

State Make of Machine

Your satisfaction is guaranteed

BURRILL SAW & TOOL WORKS

405 E. Main St., Iliou, N.Y.

Build SOLID MODELS

TRAINS • PLANES • SHIPS



All parts ready-shaped for easy assembly. Accurate, realistic scale models to decorate home or office; display on mantel, desk, or in collector's groups. Wide

range of wood model assembly kits, including Convair Flagship, 69c; Piper Cub Super Sea Scout (illustrated), 50c; the battleship California, 45c; Rock Island Rocket, \$1.59; and many others.

AT YOUR TOY OR HOBBY DEALER

Send for free circular describing models

STROMBECK-BECKER MFG. CO., Dept. PS-11, Moline, Illinois

NEW 30" SHEET METAL BRAKE

Forms angles, channels, vees, flanges, locks, zees. Handles 26 gage sheet steel, heavier gages of aluminum, copper, plastic, etc. Portable. Can be held in a bench vise, or bolted down. All steel. Wt. 40 lbs. Shipped exp. collect, \$24.50

12" BRAKE. Fits in vise to form difficult and compound bends, up to 20" gage steel 12" wide. \$12.50.
18" CURVE FORMER. Handles 16 gage steel 2" to 30" dia., \$10.00 PP.
VISE IRON BENDER. Forms rings, hooks, eyelets, etc. in 1/2" round or square; 1/4" up to 2" wide in bar iron. Price \$10.00 PP., with attachment to bend 1/2" pipe. \$12.50. **SHEAR.** Cuts 16 gage steel any length and width. \$18.50. **Sheet Metal Pliers.** 2 1/2" wide, \$2.00; 5" \$3.50. 20 page instruction booklet, 50c. Immediate delivery. Order direct, cash or C.O.D., or send for folder.

WISE BRAKE MFG. CO.

1116 So. 27th St.

Dept. S11

Omaha 5, Nebr.

Only \$16.95 Complete

DUAL PURPOSE SPRAY GUN

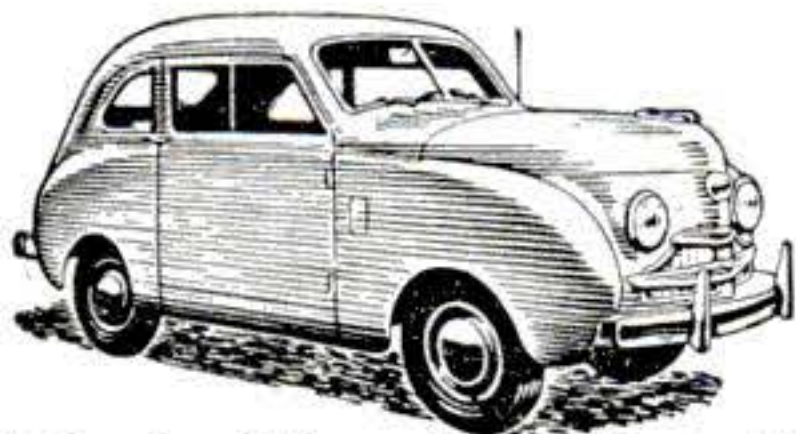
Uses Only 25 lbs. Air Pressure
FLOCKS and SANDBLASTS



AT HOME: You can refinish Lamps, Radios, Book Ends, Statues and hundreds of things with lovely colorful flocking. **ETCH GLASS:** Many designs and initials can be sandblasted on shower doors, ash trays, glassware. **AUTO INTERIORS:** Transform ugly dirty auto interiors to "new car beauty" with a **BLASTO DUAL PURPOSE SPRAY GUN.** Merely spray flock similar to Velvet, Plush, Suede and Mohair inside your car. **ANTIQUED WOOD . . . REMOVE PAINT. MAKE EXTRA MONEY** by doing any or all the above for profit. **BLASTO** is highest quality and carries a 5 day money-back guarantee. Operates on small air compressor. Send \$16.95 cash, check or money order for postpaid delivery. Write for free information. Full line of Flocking Supplies.

BLASTO SPRAY GUN MFG., Dept. PS-11, 7007 Haas Ave., Los Angeles 44, Calif.

1300 miles for \$8.50



All-steel Crosley 2-Door Sedan. Seats 4 huskies, with plenty of room for luggage. Over 25,000 now on the road, operating for about 1/2 as much as other cars. Typical owner's report:

Fay R. Stillman of Mt. Morris, Ill., drove her Crosley 1,300 miles, carrying a 900 lb. load, averaged 38 miles per gallon. Total cost, \$8.50.

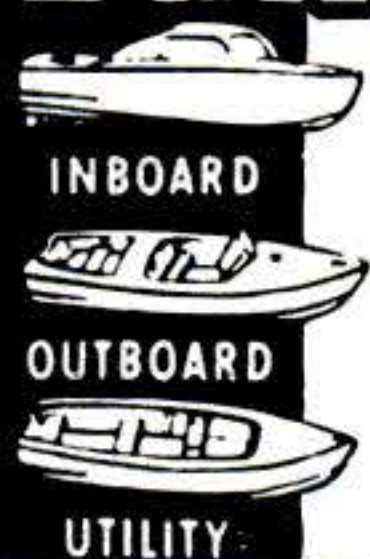
Five smart Crosley models to choose from—all with 4-cylinder, liquid cooled COBRA ENGINE.

CROSLEY

a FINE car

For beautiful, full-color catalog, write: Crosley Motors, Inc., 2532-JS Spring Grove Ave., Cin'ti 14, Ohio

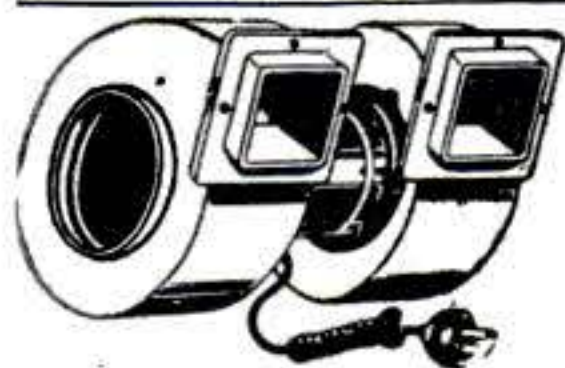
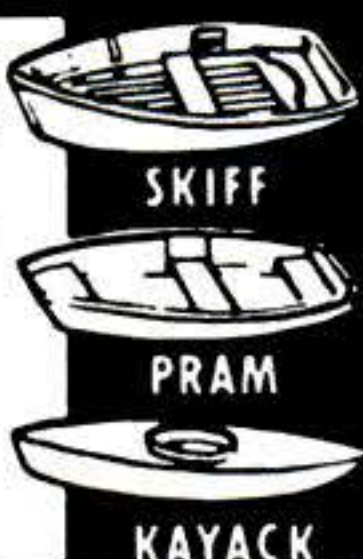
BOATS! ASSEMBLE YOUR OWN PACKAGED BOAT



16 models of outstanding design—8 to 18 ft.—prices from \$34.50 up. These complete plywood kits save you 50% or more. Assembly is simple, all parts pre-cut—frames pre-assembled.

Send 25c (coin) for complete, illustrated literature. (Literature plus booklet, "How to Build Plywood Boats," send \$1.00.)

MARINE MART, BUFFALO 7-A, NEW YORK



HEAVY CAST ALUMINUM DOUBLE EXHAUST BLOWER ONLY \$16.85

Excellent for Coal Furnace Blower. Use cheap Buckwheat, Rice coal instead of expensive Stove coal. Gives hotter water, faster. Removes gas fumes from garages. Install it yourself with any household tools. Double intake and exhaust from 2 balanced wheels. Flanges for attachment to ducts. Cont. duty motor, 110 V., A.C. 56-60 cycles. **SINGLE EXHAUST BLOWER—** Delivers App. 100 CU. FT. AIR per MINUTE—\$11.25. Add 50c handling; \$1 west of Miss. Send check, M.O. Money Back Guarantee. Free lit. Universal Yonkers Corp. (S-11), 137 Alexander St., Yonkers 2, N. Y.

BOYS-IT'S FREE!

Exciting, new book tells about "ATOMIC ENERGY"

and "THE WONDERS OF CHEMISTRY"

Also shows how to amaze friends with Chemcraft magic and do many exciting home experiments. Free. Send today!



THE PORTER CHEMICAL CO. 58 Prospect Ave., Hagerstown, Md.



6 HP MIDGET CAR AS LOW AS \$169.50

Rear Mounted, Air Cooled Twin Cylinder Engine, "Automatic" transmission. Large

16" "Air Float" tires. Carries 2-3 PSGRS. 40-50 MPH. 75 MILES GAL. GAS. "Streamflo" Aluminum Body. Lights—Horn—Starter.

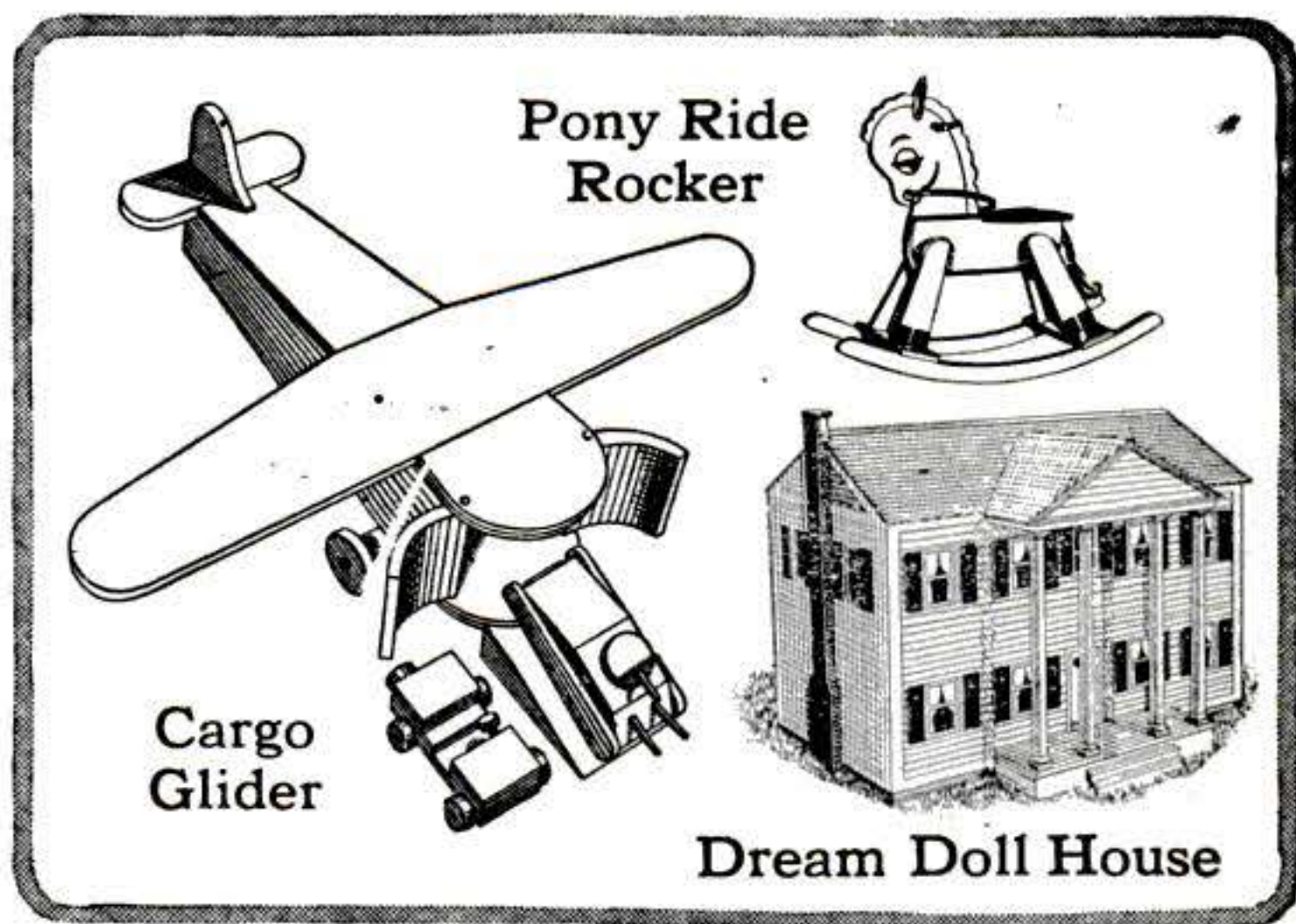
SEND \$1.00 (cash, MO, ck or \$1.52 COD) (refunded first parts order) for EZ to read blueprint plans, assembly instructions, pictures and parts. **Price List with detailed catalogue on 135 other products such as: 4 H.P. Midget Motorcycles-Scooters, 2 H.P. Garden Tractors, Gas Bike Motors-Sidecars, Pocket Radios "Walkie Talkies."** MOTOR INDUSTRIES Dept. PMA-11 KEARNEY, NEBR.

TALK—SING—PLAY OVER ANY RADIO

With the NEWEST REAL RADIO MIKE! Attaches in a jiffy—FULL INSTRUCTIONS GIVEN! SWELL FOR "PARTIES"—"CUT IN" ON OR "KID" REGULAR NETWORK PROGRAMS OR PUT ON YOUR OWN BROADCASTS! AMAZE YOUR FRIENDS—REAL FUN! LEARN RADIO BROADCASTING! BEAUTIFUL SILVER PLASTIC Detachable base—6 ft. wire!

SEND NO MONEY Just pay postman \$2.99 COD plus postage or send \$2.99 and we pay postage!

ORDER your own real RADIO MIKE TODAY—NOW! MIDWAY SALES CO., Dept. MPS-11, Kearney, Nebr.



HAVE FUN! SAVE MONEY! BUILD TOYS WITH EASI-BILD* Full-Size Patterns

Here's your chance to give the kids a real "toy" Christmas without breaking open their piggy banks to do it. You can build the toys shown above and many more for half the store cost and, it's easy—you simply trace the full-size pattern on wood; saw, and assemble with Cascamite, described below.

*Reg. U. S. Pat. Off. by Easi-Bild Pattern Co.

How to choose a glue!

Follow these directions and solve all your gluing problems:



For boats, outdoor furniture, sports equipment—joints that must withstand outdoor exposure—CASCOPHEN (Resorcin Resin Glue). The first completely durable glue available to homecraftsmen!



For furniture, toys, heavy-duty home repairs—strong, stain-free, moldproof, highly water-resistant CASCAMITE (Urea Resin Glue). Mixes quickly with cold water!



For models, photo prints, labeling—general home, school, or office gluing, use the new, clean, white, fast-setting CASCOREZ (Polyvinyl Resin Glue). Liquid ready to use!

Send Coupon for Toy Patterns to

Casco Pattern Dept. PS-118
P. O. Box 215, Pleasantville, N. Y.

Enclosed is _____¢ for patterns checked below.

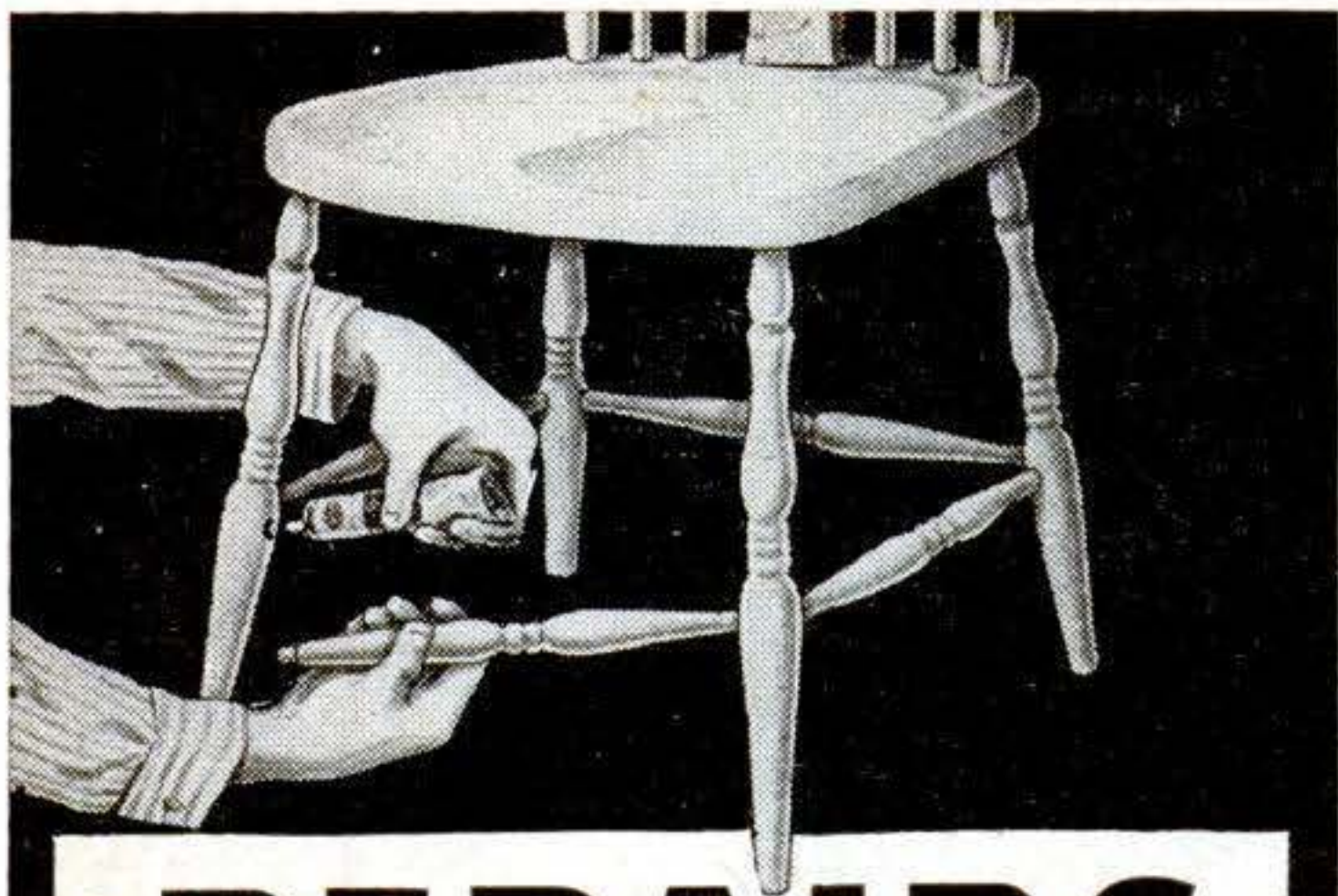
- ☐ Dream Doll House, Pattern #33--50¢
- ☐ Pony Ride Rocker, Pattern #53--35¢
- ☐ Cargo Glider, Pattern #70--25¢
- ☐ 32-page Pattern Book illustrating 94 pattern projects--20¢

Name _____

Address _____

City _____ Zone _____ State _____

THE BORDEN CO. • CHEMICAL DIVISION
Makers of Casco Glues



REPAIRS

FURNITURE, LUGGAGE, ETC.

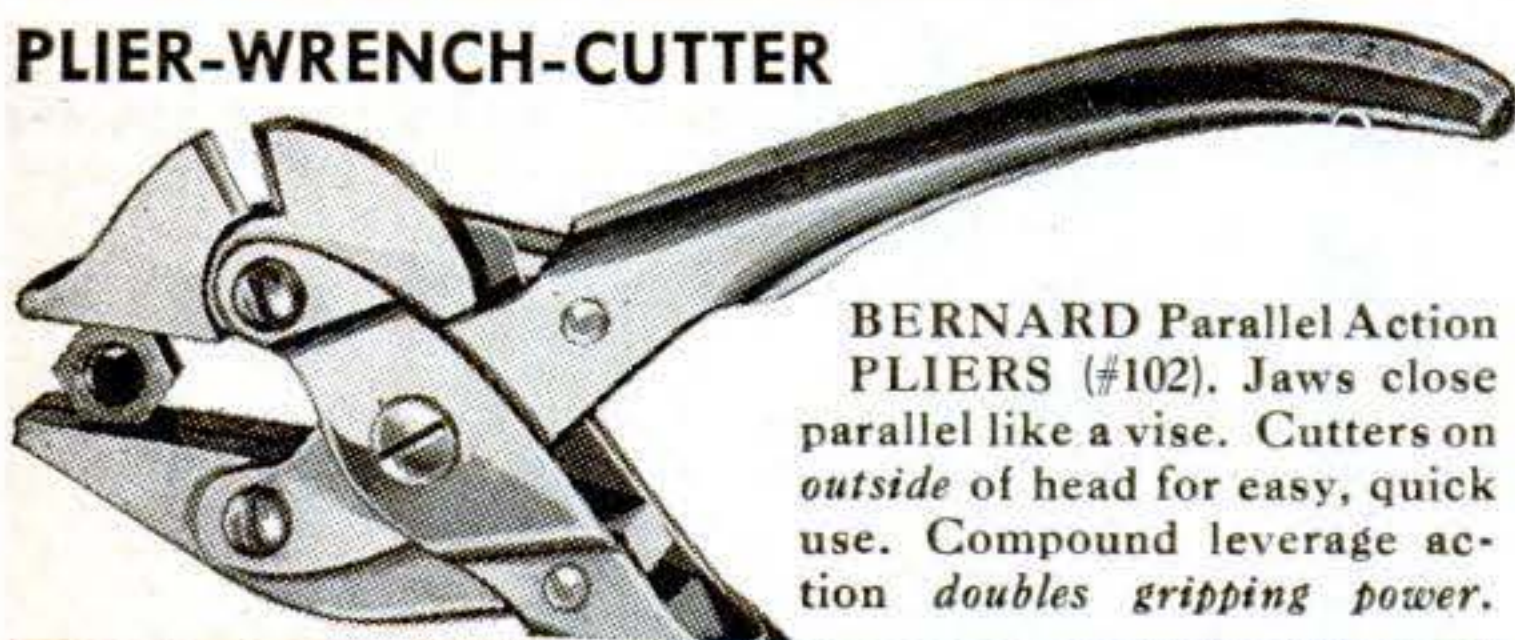
It's transparent, water-proof, flexible and durable.



DUPOCEMENT

REG. U. S. PAT. OFF.

3 TOOLS IN ONE PLIER-WRENCH-CUTTER



BERNARD Parallel Action PLIERS (#102). Jaws close parallel like a vise. Cutters on outside of head for easy, quick use. Compound leverage action doubles gripping power.



BERNARDS work like a wrench. Parallel jaws fit snug on nut.

Cutters on outside of head. Easily cuts baling wire.



Compound leverage doubles gripping power. 6 1/2" size cuts 8-penny nail.

Breaks glass perfectly. Jaws close flat against glass.

At your local hardware store. Write for free literature

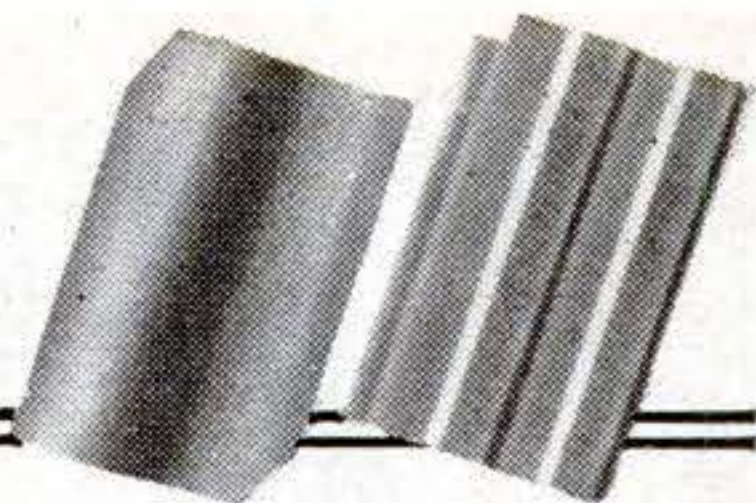
SARGENT & CO.
(SCHOLLHORN DIV.)

87011 Water Street
New Haven 9, Conn.

Faithful Quality Since 1870

BERNARD

Outstanding Manufacturing Opportunity



More Local Duntile Plants Must Be Installed

Amazing demand for DUNTILE — World's Most Beautiful Roof — opens up new manufacturing opportunities for men of modest capital, backed by vision and aggressiveness. Ties in with the great building industry, now starting its biggest period in history. Duntile is masonry — strong, safe, enduring. Smart design, in choice of many select colors. Has pride-appeal to every home owner. Definitely economical. With these advantages it has unlimited market possibilities. Manufacturing is easy; we supply all equipment for automatic, low-cost production. Excellent profits — 100% - 125% mark-up on basic costs. Write immediately for literature and Manufacturing Analysis. Get into this business NOW!



W. E. Dunn Mfg. Co.
429 W. 24th St., Holland, Mich.

DUNTILE



6000 Smash Hits—

In 388 Page
Wholesale Book
for Garagemen, Variety, Drug,
General, Hobby Store and Fill-
ing Station Operators.

You will find this Book bulging with Tested Money Makers. Average price reductions on many items about 21%. Since 1922 our money back guarantee is source of confidence to all buyers. 25c and your request on your letterhead brings this latest 1949 Wholesale Catalog of 6000 Tested Sellers. You may take credit for the 25c on your first order. In that way the Book will not cost you a cent. Stock of catalogs, is limited so suggest you send for a copy. NOW, using your letterhead.

SPORS CO.

9-48 Creek,

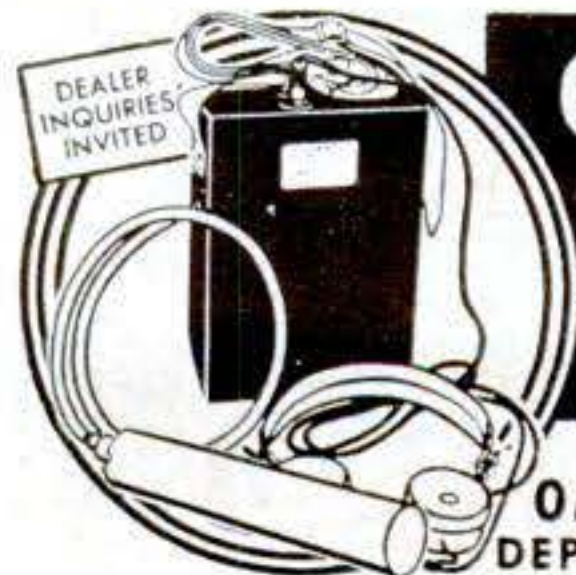
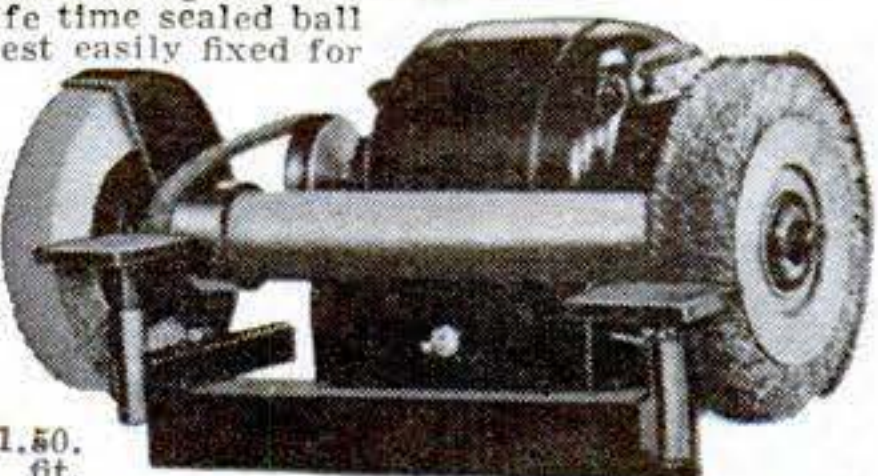
Le Center, Minn.

PORTABLE BENCH GRINDER \$18⁹⁵ less motor and stones

Suitable for hobby shops and excellent for industrial work requiring heavy buffer or grinder. Rugged 100% steel construction. Life time sealed ball bearings. Adjustable tool rest easily fixed for face or side of stones. Convenient toggle switch. 13" between wheels allows wider range of work 6" x 1" x 1/2" stones—can be used until only 2" left. Can be permanently mounted or will rest firm without bolting.

Costs only \$18.95, without motor or stones. 1/3 H.P. GE motor, 60 cycle, \$21.50. Bench grinder stones to fit, \$2.50 ea. Send check or money order. Shipped F.O.B. Pasadena, Calif. ORDER DIRECT. Today. Write for Free Bulletin No. 21-A

MODERN MANUFACTURING CO., 160 N. Fair Oaks, Pasadena 1, Calif.



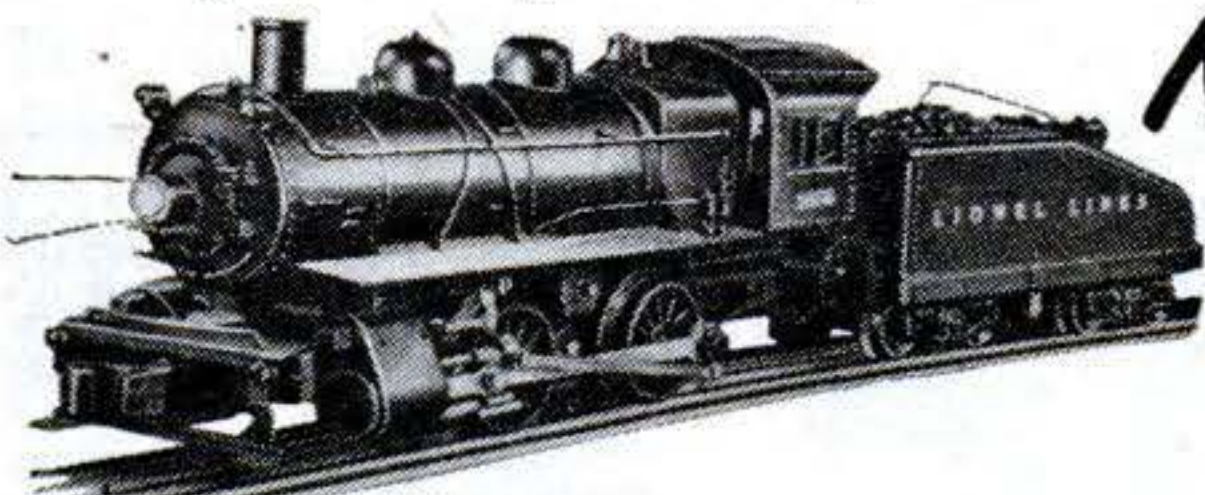
GEIGER COUNTERS FOR LOCATING RADIOACTIVE MINERALS • FOR HOSPITAL AND INDUSTRIAL USE.

Write for Details and Prices
OMAHA SCIENTIFIC SUPPLY CORP.
DEPT. 11, 3623 LAKE ST., OMAHA 4, NEBR.



Two Majestic New Diesels featured by **LIONEL TRAINS**

Two big, powerful LIONEL Diesels, just like the kind that have been shattering speed records for the *New York Central* and *Santa Fe* railroads! Patterned after the famous General Motors F3 type, these mighty Locomotives measure 26½ inches long and are powered by TWO motors!



Special Offer:

- 1 This is what you get: beautiful, 36-page full color LIONEL TRAIN Catalog.
- 2 Set of 3-Dimensional views of LIONEL TRAINS in Action.
- 3 Pair of Stereopticon Eyeglasses for viewing scenes.
- 4 Special Kit of 6 cut-out colorful buildings to create realism for your train layout.

Enclose 25¢ with coupon!

SEND FOR IT AT ONCE!

Other LIONEL TRAINS puff SMOKE and blow a realistic WHISTLE.

Send for the new Catalog and Special 25¢ Offer now—it tells all about the Electronic Control train, new rolling stock, LIONEL Construction Kit and many other features.

New Switcher for 1948

Every model railroad fan will want this powerful little "yard goat" for his pike! Modeled after ladder-back type used by major lines in U. S. Has automatic built-in bell and back-up light.



LIONEL TRAINS, P.O. BOX 330
Madison Square Station, New York 10, N. Y.

I enclose 25¢. Please send me Special Offer of 36-page full color Catalog, Stereopticon views of LIONEL TRAINS, Stereopticon Eyeglasses, and Kit of 6 building cut-outs.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

NEW FOREDOM Model #99 at an Amazing LOW PRICE

**FLEXIBLE SHAFT
MACHINE
with PENCIL-SIZE
HANDPIECE**

**\$15⁹⁵
COMPLETE
WITH
MOTOR**



**Grinds, Polishes, Cleans,
Sharpens, Mills, Carves,
Engraves, Etches on Metal
Wood, Glass and Plastic**

5 REASONS WHY FOREDOMS ARE TOPS:

1. Extra power and longer motor life because motor not dwarfed to fit hand.
2. Correct handpiece size for deft, sensitive, finger-tip control.
3. No obstructed view of your work.
4. Freedom from gyroscopic action—hence better work.
5. Small handpiece size lets you get into hard-to-reach places.

Hundreds of Uses

Foredoms handle hundreds of tasks. Use them for pleasure or profit, for tinkering or expert craftsmanship. Their versatility is unlimited. Use them to grind, polish, mill, engrave, sharpen, slot, rout, saw, carve, clean, sand, etch, cut, etc. Ideal for internal carving of plastics, the astounding new craft. You can work on wood, glass, plastic and all metals with a Foredom. No. 25 Accessory Set (A truly versatile assortment) only \$5.50 extra.

Over 70,000 Foredoms now in use



**Foredom PRESTO-FLEX
with
PENCIL-SIZE Handpiece \$5.95**

- Now turn your old motor, drill press, or electric drill into a Flexible Shaft Tool. Simply attach to your electric drill, drill press or motor. Presto—a flexible shaft machine! Off again in a jiffy! Pencil size handpiece gives you finger-tip control. Gets into tight places you can't reach with any other tool. Handy 35" overall length. And—only \$5.95 complete! Not to be confused with inferior imitations. Precision made, backed by 1/4 century experience in this field. All parts replaceable. Order NOW. If ordered for use on motor, specify motor shaft diameter and add 50c for coupling. (Available for 1/4", 5/16", 3/8", and 1/2" shafts.) No. 50 Accessory Set Available \$1.50 extra. Order TODAY.

FOREDOM ELECTRIC CO., Dept. B1011
27 Park Place, New York 7, N. Y.

Mail Coupon Now

Please send me FOREDOMS checked below on 10 day trial.

☐ Presto-Flex Tool (\$5.95)	☐ No. 50 Accessory Set (\$1.50)
☐ Motor Coupling (50c)	☐ No. 25 Accessory Set (\$5.50)
☐ Specify motor shaft diameter...	☐ Catalog on request
☐ Flexible Shaft Machine (\$15.95)	

☐ I enclose payment. Send postpaid.
☐ Send C.O.D. plus postage. I will pay postman.
(Money back either way if not delighted)
Enclose this coupon with name and address

BINOCULARS	
U. S. Navy 7 x 50.....	\$95.00
BINOCULARS	
U. S. Army 6 x 30.....	\$57.50
5 Power Ranger	
TELESCOPES	\$2.00
Engineers Metal Army Type and	
SIGHTING LEVELS	\$2.00
SURPLUS GOVT. TRIPODS for Level,	
Transit, Cameras, etc. Used. Good Condition.	\$5.95
NEW TRIPODS for Transits, Levels, etc.	\$13.50
Value \$75.00. Special.....	
TRANSFORMERS , Western Electric,	\$4.95
5 volt to 650, New.....	
CANVAS SAFETY BELTS , Metal Snaps,	75c
New, \$3.00 Val.....	

Public Sport Shops

11 S. 16th St., Phila. 2, Pa. No COD'S



**FREE
BOOK**

**TELLS HOW
YOU CAN
LEARN TO**

**MOUNT BIRDS and
ANIMALS**

BE A TAXIDERMIST—Learn by Mail

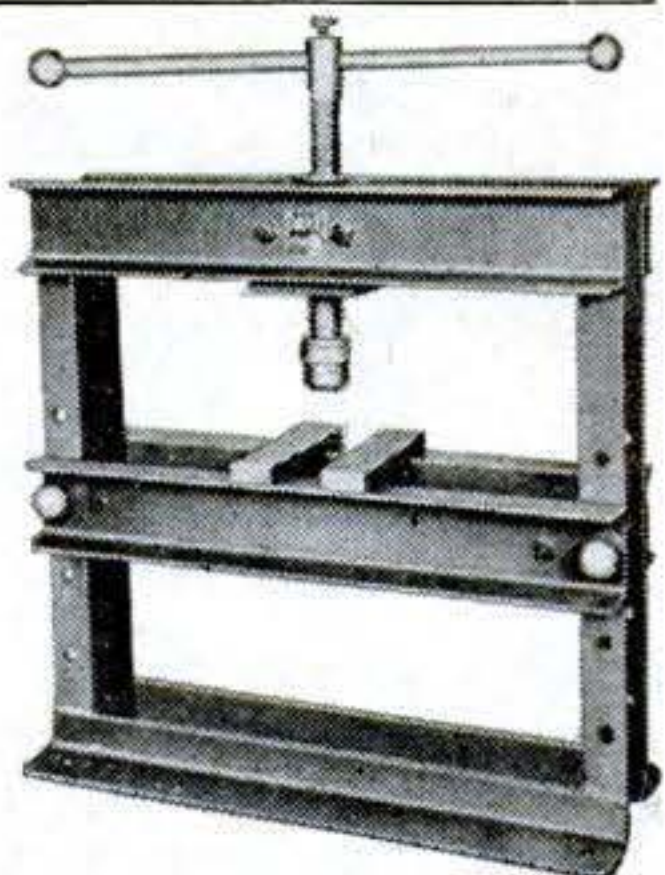
Easy home lessons teach you quickly how to MOUNT BIRDS, ANIMALS, GAME-HEADS, FISH—to TAN LEATHER, FURS. Save your hunting trophies. Have a home museum. It's thrilling! Taxidermy is wonderful, FUN, A PLEASURE HOBBY AND A MONEY MAKER.—Investigate! Get this strange FREE BOOK. **EXTRA MONEY:**—Earn in your spare time. Sell your mounts; and do work for other sportsmen. Students report \$30 to \$75 and more per month. Big demand. Fine prices. If you want REAL PROFIT from spare time WRITE TODAY.

FREE BOOK—with 100 photos of wild game. Tells about Taxidermy and how YOU can learn, easily, quickly. Old reliable school. 275,000 students. — STOP this minute and TEAR OUT THIS AD NOW as a reminder; then write; get the free book. You will be delighted, AMAZED. RUSH postal or letter and learn how to have more FUN, FASCINATION, PROFIT. State your AGE.

Game is growing
scarcer—every
specimen valuable!

A 10-Ton Press at Low Cost

Pressing, separating, bending, and straightening jobs in your shop are easy with this press. Ten-ton capacity provides ample pressure. Adjustable table takes work up to 18 inches wide and 11 1/2 inches high. Send for free bulletin showing press and wide variety of accessories.

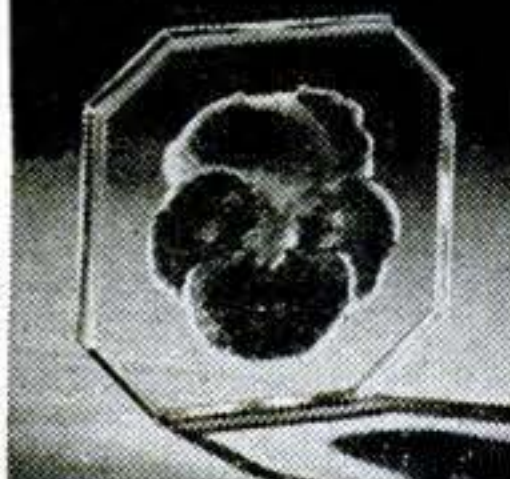


UT-10A Press f.o.b. factory \$31.00

DAKE ENGINE COMPANY
622 Seventh Street, Grand Haven, Michigan

Plastic Coasters
and Tiles

**EMBED REAL FLOWERS
in NEW Magic PLASTIC**



Now create many lovely and unusual things like the distinctive pansy coaster shown—made by embedding real pansies in Castolite—the "magic" liquid casting plastic. Comes crystal clear, or may be dyed to produce gorgeous color effects. Make really different jewelry, book ends, picture frames, candle sticks, figurines. Embed butterflies, coins,

medals, photos, for novel plaques, paper weights, tiles, other art objects. Use only home utensils. Follow simple step by step method. New pleasure, fine profits are possible. Send 25c for exciting new Home Project Manual showing how to get started. Write today! The Castolite Company, Dept. M-4, Box 391, Woodstock, Ill.

MANUAL
25c

EASY TO BUILD

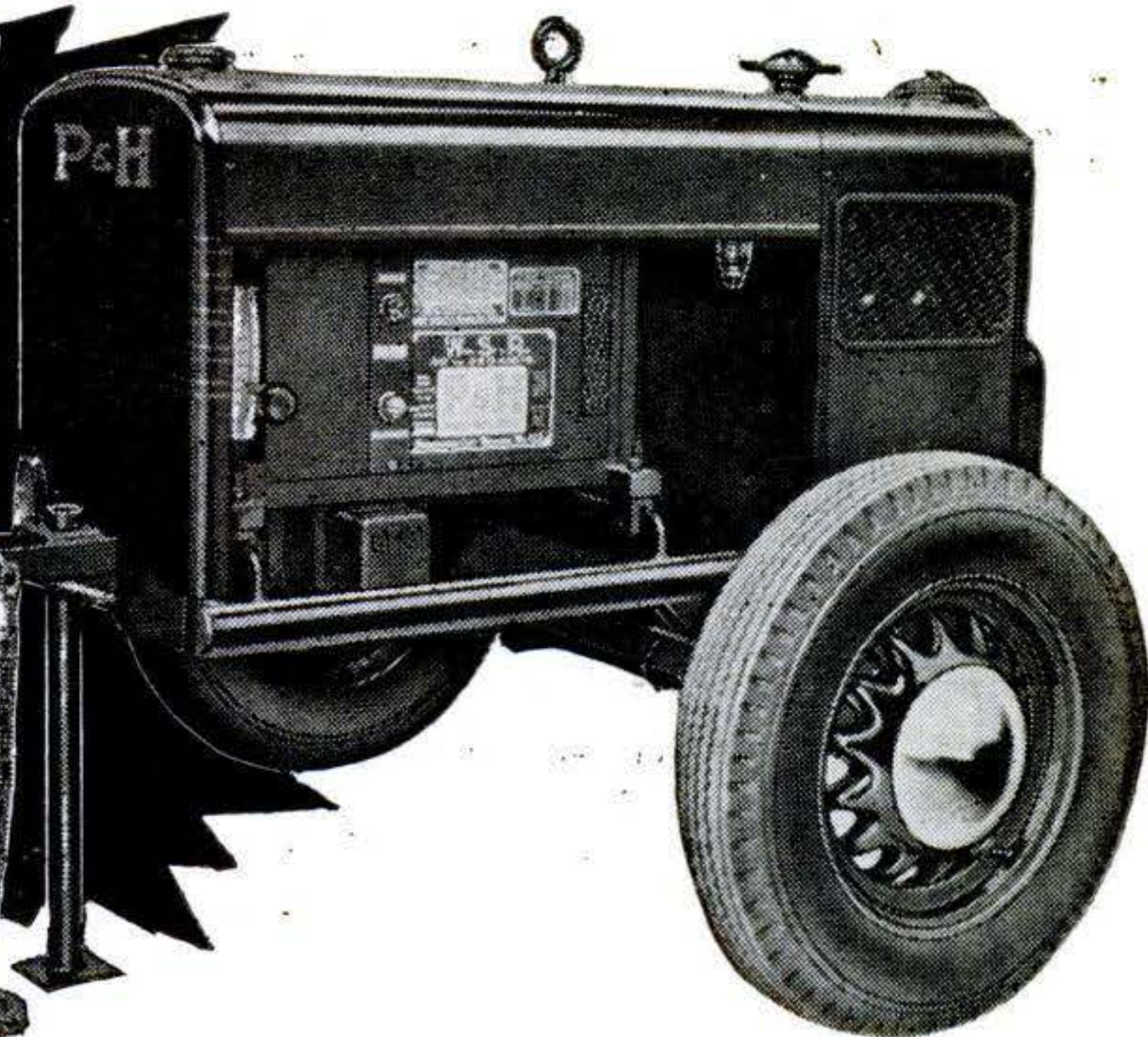
U-MAK-IT BOAT KITS for Home Assembly. Complete with Illustrated Instructions. No Experience Necessary. SEND 25c Postage (Coin) Today for 3 Money Saving Illus. Catalogs Showing all '48 Models & Construction Details.

KAYAK BOAT CO.
703R-WHITTIER ST., N. Y. 59, N. Y.

**KAYAKS
INBOARDS
OUTBOARDS
ROWBOATS
RUNABOUTS
DINGHIES
V23 CRUISER**



Take Your Shop Weld with You



These industrial and commercial arc-welding jobs are easier to do and cost less when you use P&H DC Arc Welders: All types of industrial welding. Sub-contracting work for large manufacturers

Air conditioning
Home heating
Truck body building
Trailer building

Automotive Repairs { blocks fenders frames

Fuel-oil tanks
Contractors' welding
Bridge work

Construction equipment repairs { excavators tractors graders ditchers, etc.

Kitchen equipment
Cabinet work
Fabricated housing
Fabricated garages
Cast iron repairs
Maintenance work for industrial plants
Ventilating systems
Bicycle repairs
Stainless steel bar equipment
Ornamental iron work
Fabricating equipment of your own design

P&H Model WG-200 Welding Generator mounted on a Jeep.



Go after the Profitable welding jobs with a handy P&H Portable Welder

Don't limit yourself to the welding business that can be brought to your shop. Use an easy-towing P&H portable welder to provide full weld-shop facilities wherever there's a need for them. Go out after interesting jobs, do a wide variety of work, make more money.

There are two sizes of P&H Portable Welders

Both welders are sturdy. Both are economical. Fool-proof idling devices keep gasoline consumption to a minimum. The WN-200, is powered with an air-cooled motor. It gives you a welding service range from 30 to 260 amps. A power take-off lets you operate handy electric tools.

The WN-300 has a welding service range of 30 to 375 amps. This unit uses a water-cooled gasoline engine.

Both can be furnished as stationary models to mount on a truck, or as two-wheeled trailers. The WN-300 is also available with a 4-wheel mounting.

Easy to use

The generator used in P&H portable welders has only one simple heat control. Volt-ampere regulation is automatic. Just select the heat you want from the clearly marked plate found on every P&H welder. Then move the single control to the setting picked. The machine does the rest. There is no fussing with dials, gadgets, or special instruments. Welding is easier, faster, and better.

You can count on P&H machines to give you satisfying, trouble-free service

There are only two major parts in P&H DC welding generators—the rigid frame and a compact rotating member. A powerful air stream cools them. Special insulation coatings resist heat and assure high efficiencies.

You can build your own DC Welder

Lots of people with spare gasoline or electric motors on hand save money by build-

ing their own welder. We have 2 sizes of bare welding generators for this purpose. The WG-200 gives you 30 to 260 amps and the WG-300 30 to 375 amps. If you have a Jeep with rear power take-off, you can use a P&H bare generator to make a neat portable welding outfit.

There's a money-saving P&H DC Arc Welder for every welding need

Take the WA-200, for example. It requires only 3½ square feet of floor space. A single WA-200 unit gives you 30 to 285 amps. Its construction is such that it can be stacked one on top of the other. Thus you can combine the output of two machines (60 to 570 amps) without using more space.

The WSR-500 is larger than the WA-200, giving you a welding service range from 60 to 500 amps.

All P&H DC Arc Welders have these important features: Single heat control. Automatic voltage regulation. Only two major parts. Powerful air-stream ventilation. Easy operation.

Your P&H distributor can show you why it pays to own a P&H machine. For complete literature, send the coupon below, clipped to your business letterhead.

P&H

ARC WELDERS
4674 W. National Ave.
Milwaukee 14, Wis.

HARNISCHFEGER

CORPORATION

Manufacturers of America's Most Complete Arc Welding Service

TEAR OUT COUPON, ATTACH TO YOUR BUSINESS LETTERHEAD, AND MAIL TODAY

HARNISCHFEGER CORPORATION

4674 W. National Avenue, Milwaukee 14, Wis.

Yes, I'm interested in the easy operation and dependability of P&H DC Arc Welders. I would like information on the items I have checked below:

- | | |
|--|---|
| ☐ P&H Portable Welders | ☐ Send address of distributor |
| ☐ P&H Bare Welding Generator for building my own welder | ☐ Send representative |
| ☐ P&H Industrial Welders | ☐ Send Free Book, "Simplified Welding" |

Name.....

Position.....

Address..... ☐ Home ☐ Business

City..... (....) State.....

**Avoid costly errors
making color shots**

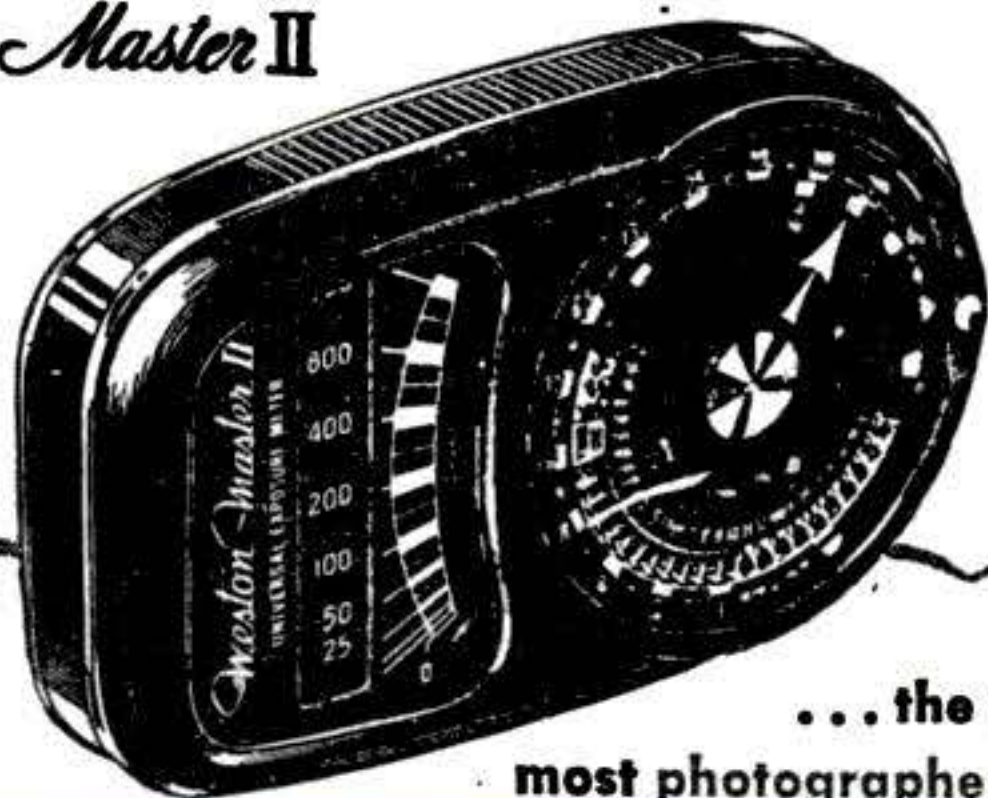


Color scenes are tricky. You need a WESTON Exposure Meter to give you correct camera settings, and insure color-true, perfect exposures. It's the meter used by amateurs and professionals everywhere to prevent picture disappointments and film waste. Sold by all leading dealers.

WESTON

EXPOSURE METER

Master II



... the meter
most photographers use

MEN'S FULLY GUARANTEED NEW 15-JEWEL WRIST WATCH \$13.95 PLUS TAX

ORIGINALLY sold up to \$55

Sacrificed Because They're
POST-WAR Surplus

WATERPROOF—SHOCKPROOF

Luminous dial.... sweep second hand.... antimagnetic.... imported Swiss precision movement and case. You get them now for a small fraction of original prices. Don't delay! Order now.... while they last. Send only \$1 down payment with order. Pay balance to postman on arrival, plus postage. Or we pay postage if you enclose \$13.95 plus \$1.39 Fed. Tax.

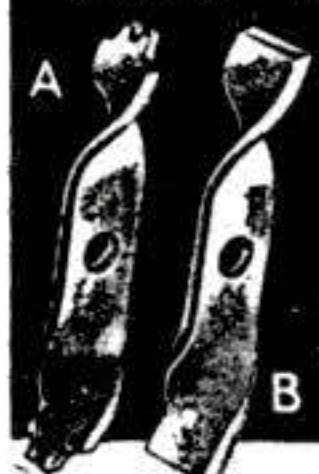


Receive Reg. \$2 expansion band FREE with prepaid order.
Money back in 5 days if not delighted. Order Now!

MARYLAND DISTRIBUTORS, Dept. 115
501 E. Baltimore St. Baltimore 2, Md.

USE YOUR BENCH SAW

FOR JOINTING & CUTTING MOULDINGS



With our six inch tool steel cutters make mouldings, casings, drop-leaf tables, grooves beading and jointing. Moulding cutters, A 1 in. wide \$1.50. 1 1/2 in. \$2.00. Jointing cutters, B 1 in. \$1.50. 1 1/2 in. \$2.00. E 1 in. for drop-leaf tables, \$1.50. E 1 1/2 in. Makes 3/4 in. cove & Quarter. \$2.00. Postpaid. Guaranteed. State size hole. List & Folder free.

JOHN A. SANDSTROM
Rt. 1-P. Clearwater, Fla.

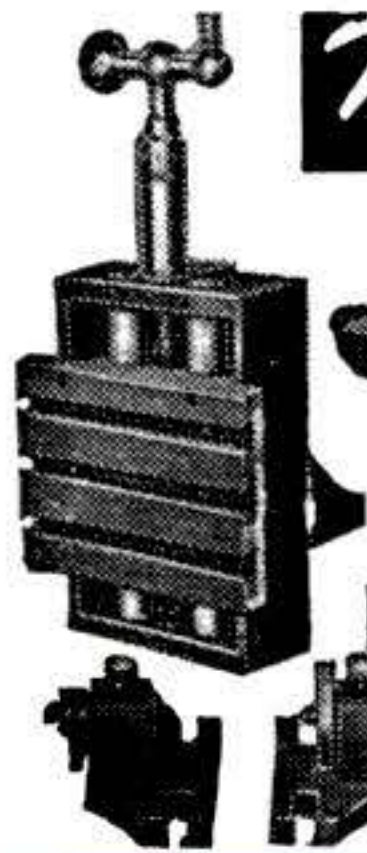


MAGIC TRICKS

It's FUN to do MAGIC

Be popular! Amaze—mystify—entertain! For 30 years Douglas has satisfied customers all over the world. Now, you can enjoy this fascinating hobby. Only 10c brings our new 1949 Catalog 500 Tricks, containing brand new tricks for pocket, parlor, stage. Join in the fun—send 10c today!

Douglas Magicland, Dept. P, Dallas, Texas



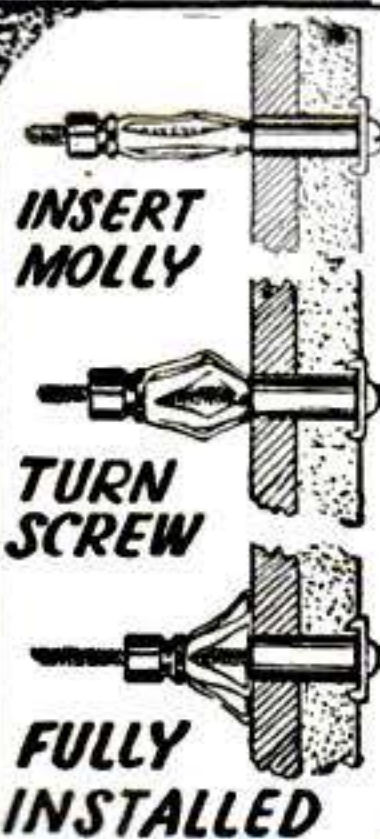
New MILLING ATTACHMENT

Sizes for 8" to 16" metal lathes

Build it yourself from our sets of semi-machined castings and save \$\$\$. Can be finished on your lathe alone. Complete drawings and instructions furnished with castings. Mill keyways, slots, splines, dovetails, flutes in reamers, special cutters. Produce gears, ratchets, racks; bore, face, etc., with this precision attachment.

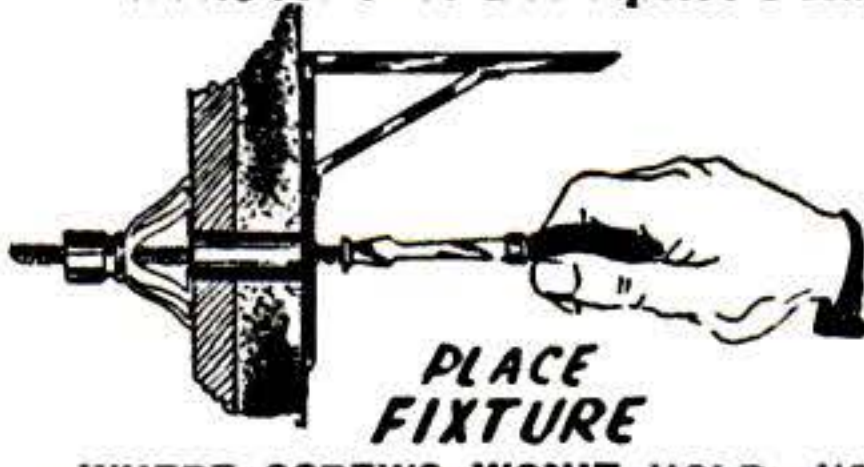
FREE! Illustrated folder and price list of castings, milling cutters, etc. Write today. Mention your lathe.

HURON MACHINE AND TOOL CO.
YALE 2, MICHIGAN

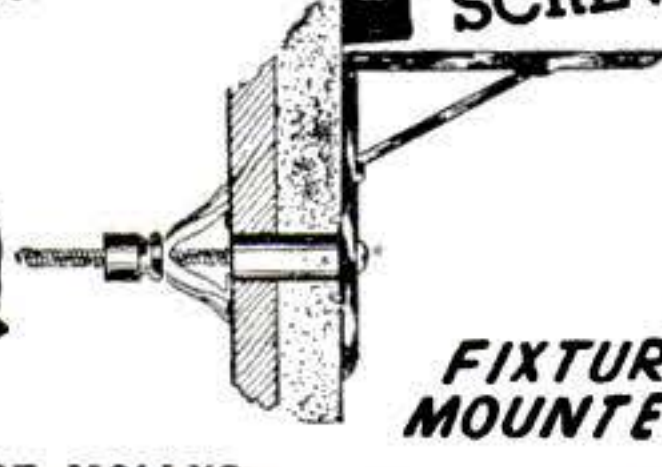


WITH MOLLY YOU CAN FASTEN ANYTHING
and do it quickly, neatly and safely. MOLLY will hold fixtures securely to floors, ceilings or any hollow wall construction... Simple to install, all you need is a screw driver. Sold by leading hardware stores everywhere.

Write for Free Descriptive Folder



WHERE SCREWS WON'T HOLD—USE MOLLYS



MOLLY CORP.
522 COURT STREET
READING, PA.

A SMOKER'S CHRISTMAS

Give him the new imported Czechoslovakian pipe on Christmas day—he will enjoy the relaxing luxury of a cool smoke. Both pipes have chrome capped bruyere bowls—moisture traps—stems are made from genuine cherry and mouthpieces are horn bit. We also have long pipe in metal-lined bowl at \$4.25. State which you prefer.

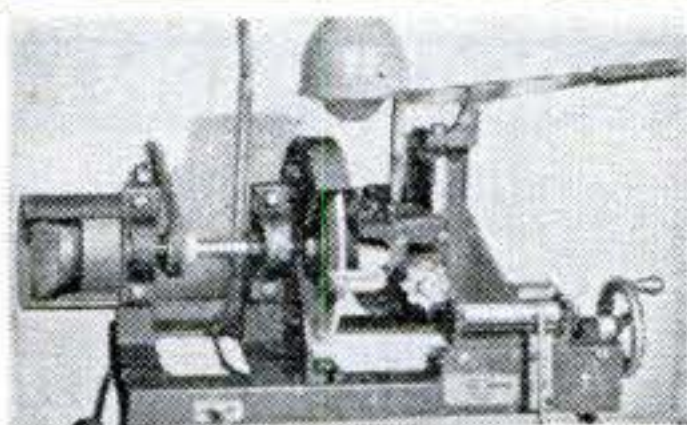
ORDER TODAY!

Send cash, check or money order for full amount and we prepay postage. C.O.D.'s—postage extra on C.O.D. orders.

MACH CO.,
CZECHOSLOVAK IMPORTERS
2553 S. Ridgeway Ave.

Dept. 088

Chicago, Ill.



Pat. applied for

Start a NEW BUSINESS
Or Add to Your Present
Repair Business
Sharpen Dull Pipe Wrenches
Pipe Taps & Dies
"Gum" Circular Saws
Write for information.

J. C. MOORE INDUSTRIES P.O. Drawer 276
FREDONIA, PA.

100
PRACTICAL
USES

Glider Model FLAME GUN

7 MODELS
from \$22 up



KILL WEEDS, crab grass, Canada thistle,—stalks, seeds and roots. Destroy brush, caterpillar nests, diseased trees, grasshoppers, chinch bugs, etc. Clear irrigation ditches, split rocks, burn tree stumps. Sterilize poultry houses, kennels, barns. Use as portable home forge. Melt ice, thaw pipes. Safe, inexpensive. Burns only 6% kerosene —94% Air! Thousands satisfied users. Write for **FREE CATALOG**.....

HAUCK MFG. CO.,
85 Tenth St., Brooklyn 15, N. Y.

BUILD YOUR OWN Speed Equipment



Very latest methods! Construct your own Superchargers, "Water Injectors," Hi-Compression Heads, Fuel Saving Devices—easily. Saves many dollars! Get racing speed, acceleration, dynamic power increases from any automobile! Build fast stock cars! California roadsters! Hotrods! Get ingenious formulas! Speed secrets! Illustrations! Conversion ideas! Also "Economy Information"—Mileage tricks! Tuning techniques! Instructions! Picture catalogues. Including "California Restyling Ideas"—Glossy photographs! Drawings! Model revising! Customizing! Streamlining! Leatherlike bound—\$1.98 complete.

NEWHOUSE AUTOMOTIVE INDUSTRIES, 5941-A5 HEREFORD, LOS ANGELES 22, CALIF.

TRIM YOUR OWN

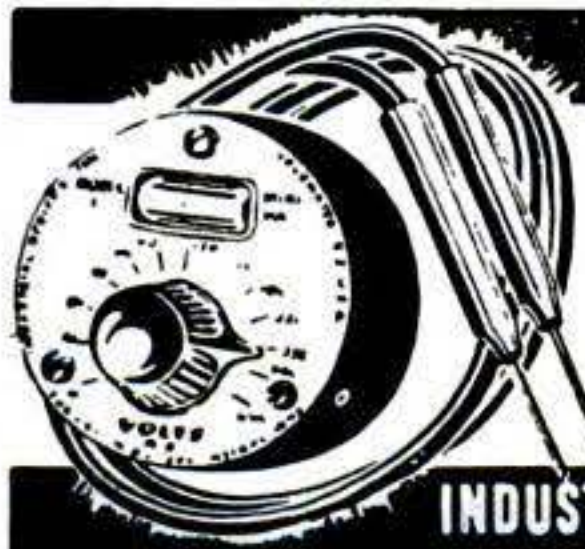
TRIM HAIR AT HOME—SAVE BARBER BILLS
Trim hair as it combs! Easy! Quick! Keeps men's, women's, children's hair trim, neat, freshly-cut looking all the time! Trims, tapers, thins out uneven hair. Use like ordinary comb. Safe. Simple. No experience required. Fine for legs, underarms! Sells Like Wild!

SAMPLES for AGENTS

Sample offer sent immediately to all who send name at once. Penny postal will do. **SEND NO MONEY.** Just your name. **KRISTEE CO.**
7 BAR ST., AKRON, OHIO

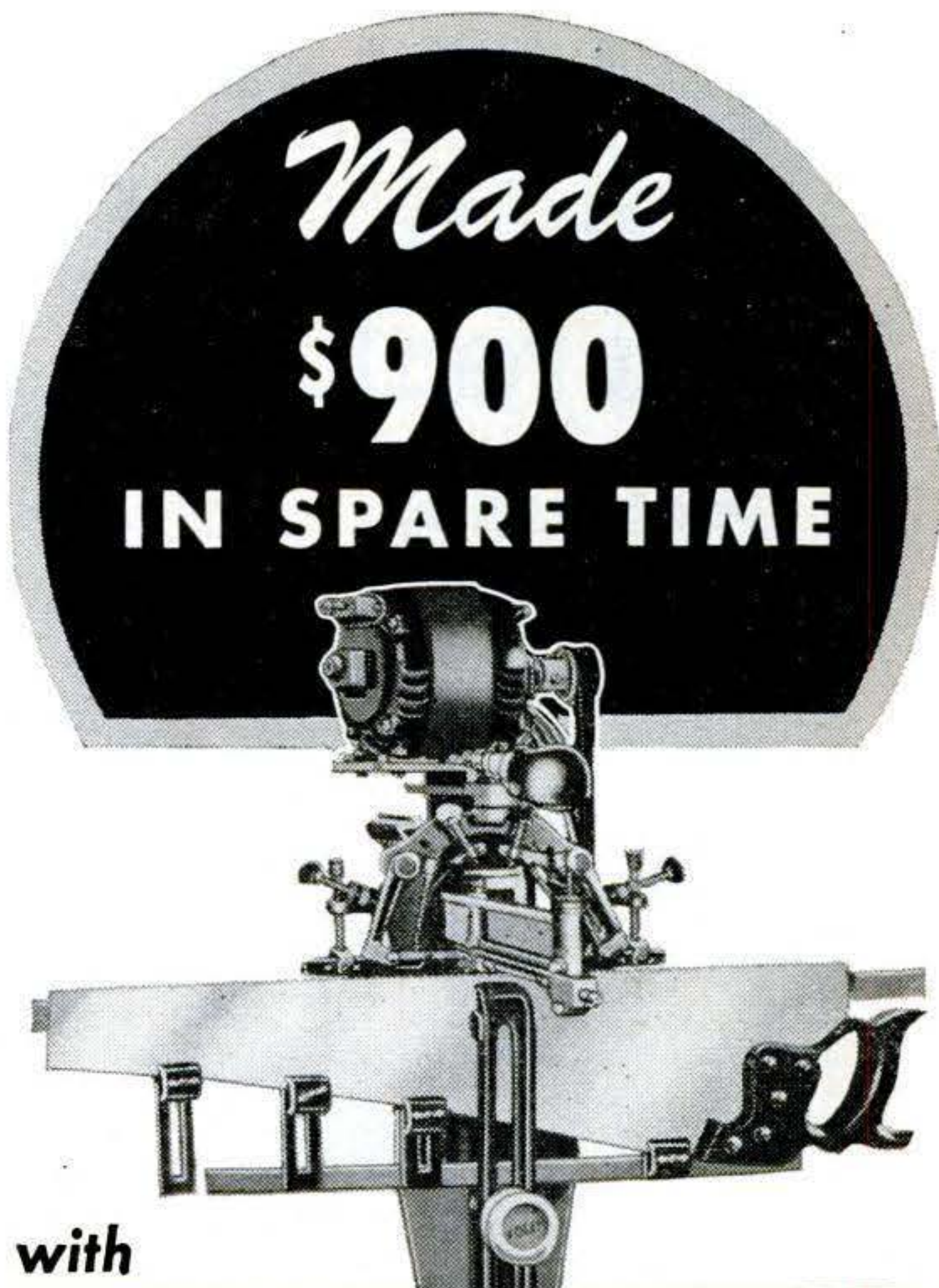


FLASH THAT VOLTAGE



Turn that knob. Extinguish the neon glow. Instantly read voltage right off dial. **MINI-VOLT** measures 65 to 660 v. AC. Also DC. Tells whether AC or DC. Virtually burnout-proof. Guaranteed for 10,000 hours' operation. Bakelite case. 12" flexible test leads and test prods. A "must" in electrical and radio work. Only \$2.75 postpaid!

INDUSTRIAL DEVICES, INC., EDGEWATER 2, N. J.



with

FOLEY* automatic SAW FILER

*Trade Mark Reg. U. S. Pat. Off.

"I did very well last year with my Foley equipment, about 950 saws and 240 lawn mowers, in my spare time. About \$900 for me." L.H.M., New York. A.G.W. in Mass. says: "I have filed over 5000 saws in 8 years and find the Foley Automatic Saw Filer very satisfactory."

Make up to \$2 or \$3 an hour in Spare Time. With the high prices of food, clothing and everything else, just think what you could do with extra money every week! With a Foley Automatic Saw Filer you can file hand, band and circular saws better than the most expert hand filer. "The first saw I sharpened with my Foley Filer came out 100%"—writes C.E.P. Every saw you sharpen with the machine accuracy of the Foley Saw Filer is an ad that brings you more customers. Cash business, no canvassing. No eyestrain, no experience needed.

FREE BOOK

INDEPENDENCE AFTER 40!

Shows just how you can start at home in spare time in your basement or garage. Just think—with a small investment, no overhead, no stock of goods to carry, you can get right into a cash business—and later on develop into a full-time repair shop. Send coupon today for this practical plan.



Send Coupon for FREE BOOK

FOLEY MFG. CO., 1119-8 Foley Bldg., Minneapolis 18, Minn.
Send **FREE BOOK**—"Independence After 40".

Name.....
Address.....

Good-looking shaves at a real saving

STROP YOUR RAZOR
AS A BARBER DOES!



RAZOR, STROP
AND
5 VALET BLADES

\$1.25

NEW VALET
Auto-Strop
RAZOR



STROPS—CLEANS
WITHOUT
REMOVING BLADE

SELF-SHARPENING . . . ONE PIECE

PAINTERS' STRIPING TOOL

A TOOL...
NOT A BRUSH

NEW, IMPROVED

Modern—streamlined—fits the hand like a fountain pen! Easy to use as a pencil. Draws parallel lines—straight, curve or circular. Does expert job on autos, furniture, toys, bikes, model planes, signs, bulletins, linoleum. (Makes wall board look like tile.)

Every painter and craftsman needs one! Type "M" MASTER Painters' Striping Tool complete with tip for 1/16" stripe. \$1.00. Tool with choice of 1/64", 1/32", 3/64", 5/64", 3/32", 1/8" tip—\$1.50 . . . all tips 75c ea. Tool with complete set of 7 tips \$5.00. (COD's postage collect) Paint dealers, write!

EASY AS
USING A
PENCIL!

\$1.00
POST
PAID



WENDELL MFG. CO.

4234-A Lincoln Ave., Chicago 18, Illinois

MACHINE SHOP EQUIPMENT



• The 1949 edition of the famous Center Tool Co. Catalog is now ready! Every workshop owner should have a copy. 240 pages full of illustrations, descriptions, and prices of the latest tools made by best known manufacturers in U.S. You pay the cost of printing—50c. **We refund your 50c with your first order of \$10.00 or more** Prompt delivery on most tools. Send check or money order today!

CENTER TOOL CO., 153 Centre Street, Dept. D, New York 13

make your own *Gems* 29⁵⁰ F.O.B.

All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only \$29.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B&I MANUFACTURING CO.
Dept. M — Burlington, Wis.



Say You Saw
It In Popular Science

BURN WATER IN YOUR CAR!

THE NEW OCTA-GANE WATER
INJECTING CARBURETOR GIVES YOU
BETTER MILEAGE & PICK-UP
MORE POWER & MORE PEP
CLEANER & COOLER MOTOR

New OCTA-GANE is the only water injecting carburetor engineered on the Venturi Principle. Only \$24.25 complete with tank. Send only \$1.00 down with special offer coupon at right. Send today! Mail postcard for particulars.

CONTINENTAL CARBURETION
DIV. 11A, 1478 UNIVERSITY AVE., BERKELEY, CAL.

DEALERS: Write on your letterhead for discounts.



CONTINENTAL CARBURETION CO
Div. 11A, 1478 University Ave., Berkeley, Cal.

Sirs: Please ship me immediately one complete OCTA-GANE assembly under the plan checked below

- ☐ \$1.00 enclosed, pay postman balance c.o.d.
☐ \$24.25 enclosed, ship fully prepaid.

(PLEASE PRINT)

Name _____

Address _____

City _____ State _____

Make, Year & Model Car _____

100 Fireplace Ideas FREE

For Home, Playroom, Cottage, or Camp

If You're Building Your Own Fireplace
HERE'S AN EASIER FOOL-PROOF WAY TO DO IT

Choose a design that will look well with the materials you have available. Prepare a concrete or brick slab the size of your fireplace. Center your FYRO-PLACE, the warm-air circulating form, on the base, and build round it. You will have a well-engineered, successful fireplace. You can't fail.

WRITE FOR BOOK TODAY
Small Book 4 1/4 x 5 1/2 sent free. Larger Book, 8 1/2 x 11, beautifully illustrated, 25c
Ask for Free Data on Outdoor Fireplaces

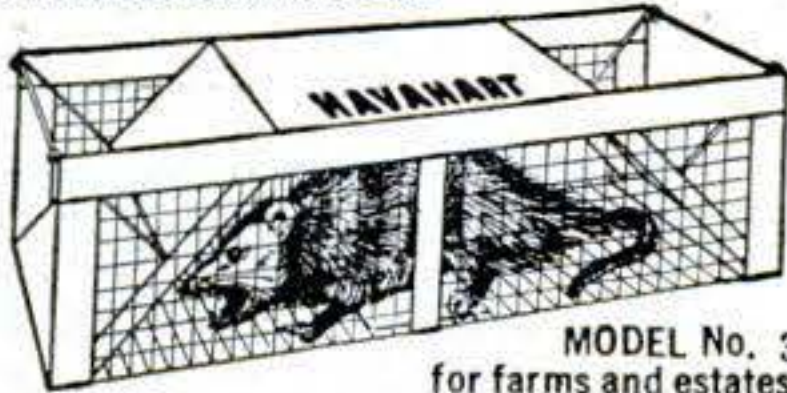


PRICE FIREPLACE HEATER & TANK CORP.
73 Austin Street, Buffalo 7, New York

AMAZING NEW TRAP CATCHES ANIMALS ALIVE!

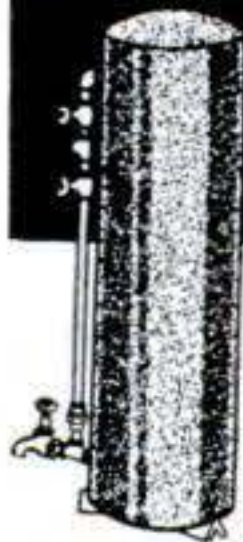
CAN'T HARM CHILDREN, PETS, BIRDS, POULTRY

It's amazing how the new HAVAHART catches rats, rabbits, squirrels and other animals, yet it's harmless to children and pets. Simple to set, rustproof. No springs! No jaws! Animal walks in to get bait, and the doors close! Send postal for free booklet.

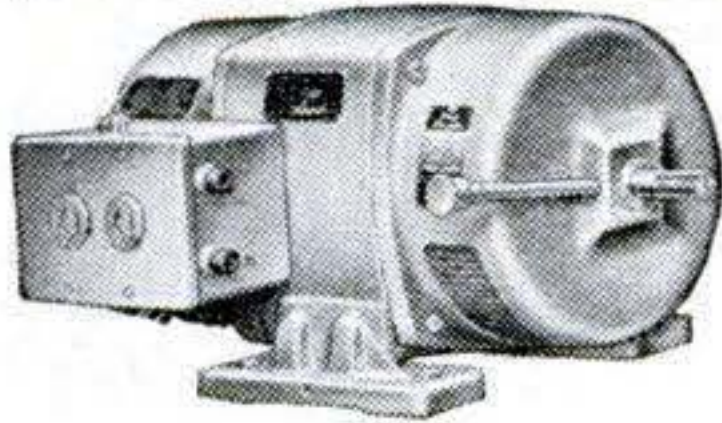


HAVAHART,
139 Water Street
Ossining, N.Y.

BUILD YOUR OWN ZEOLITE WATER SOFTENER



You can do it inexpensively with only a wrench and a little spare time. Famous Zeolite process as used by leading manufacturers. Send \$1 for easy-to-follow directions and list of materials. (Materials available locally or from us.) Or inquire about factory-built LARCO Softeners \$55.20 up. LAKE REGION MFG. CO., INC., 3920-B Lynn Ave., Minneapolis 16, Minn.



LELAND ELECTRIC GENERATOR

2.5 KVA, 120 volt, 60 cycle, 1 phase, AC. Any comparable new generator will cost you twice our price.

Remit by Bank Draft

HOPFER & COMPANY

3120-A E. 14th St., Oakland, Cal.

\$125 Freight Prepaid
In U.S.A.

CASH IN on COIN MACHINES!

New 1948-'49 SOURCE BOOK tells where to buy and how to use hundreds of money-making amusement, vending and service machines; lists names and addresses of 815 mfrs., 375 vending suppliers, 800 jobbers-distributors—plus new "show-you-how" editorial section. \$1 per copy postpaid.

COIN MACHINE REVIEW, 1115B Venice Blvd., Los Angeles 15, Cal.



YES, DEAR, WITH A HULL AUTOMOBILE COMPASS I WOULDN'T HAVE TO GO THIS FAR TO TELL A WRONG TURN!

At your dealer's.
Write for circular.

BEACONLITE

(illustrated)

\$5.95

STREAMLINE

\$3.95



HULL MFG. CO., P.O. Box 246-E11, Warren, Ohio.

Complete New SUPER POWER TOOL KIT



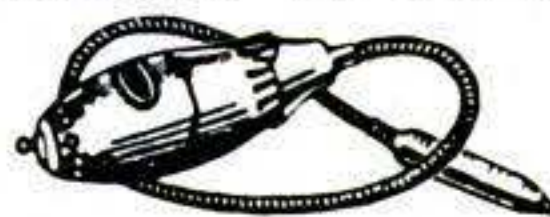
Built
by
DURO

ONLY
\$19.95

Complete With Power Unit, 5
Accessories. Sturdy Case
and Full Instructions

America's
Greatest Power
Tool Value!

Hobbyists, home craftsmen—this is the power tool kit for you! Heavy duty DURO super power unit does cutting, grinding, polishing, engraving, carving and scores of other operations. Smooth, vibrationless in operation... this DURO power unit runs at 20,000 RPM—develops 42 watts output. Complete power tool kit contains the power unit with cord, 5 abrasive points and cutting burrs and full operating instructions—for only \$19.95.

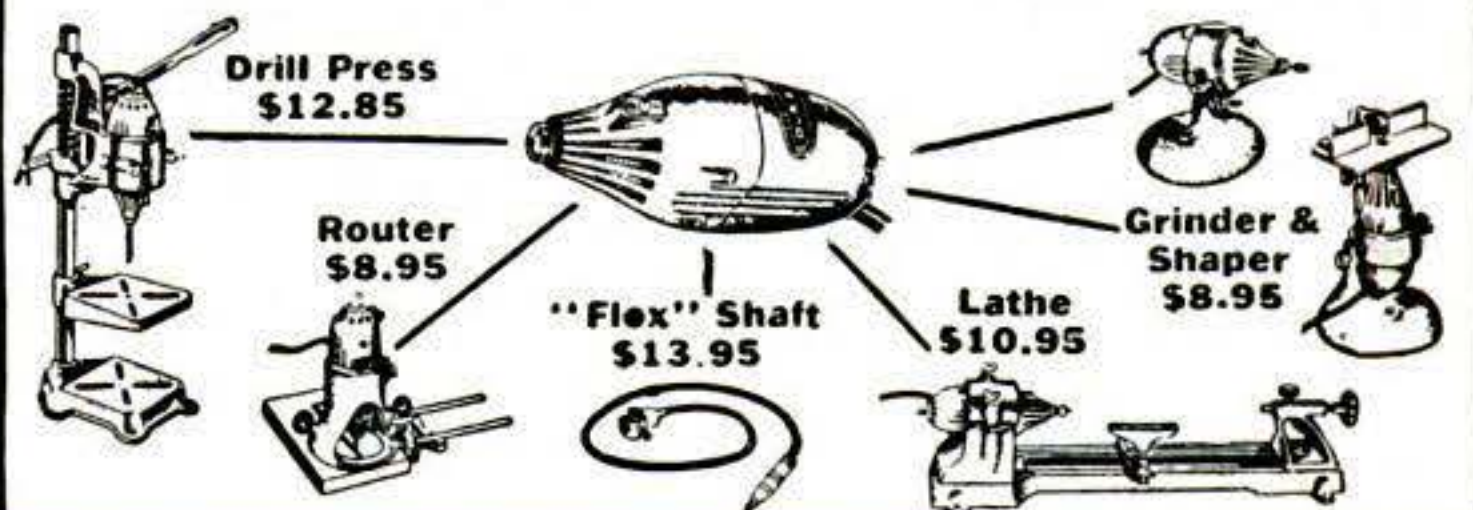


FLEXIBLE SHAFT MEANS
ADDED UTILITY!

New DURO flexible shaft with ball bearing hand piece makes engraving, free hand carving, sanding, easier, lots more fun. Double the utility of your DURO Super Power Tool Kit with this useful flexible shaft for only \$13.95

You can start with this LOW COST Power Tool Kit
... and BUILD A COMPLETE HOME WORKSHOP

One DURO super power unit is used on all of these home workshop tools! You may buy them singly—or in a group.



WRITE FOR FREE CIRCULAR giving full details on the Super Power Tool Kit and the new, low cost home workshop units.

DURO METAL PRODUCTS CO.
2675 N. KILDARE AVE., CHICAGO 39, ILL.

"FINEST precision writing instrument of its kind in the world"

Regular
84 character
keyboard
same as on
big office
machines



**5 BIG
MACHINE
AIDS**

1. TOUCH SELECTOR
2. VARIABLE LINE SPACER
3. FLOATING SHIFT
4. ONE STROKE RIBBON REVERSE
5. TYPEBAR SPEED BOOSTER

Ask dealer for demonstration

ASK
ABOUT
BUDGET
PLAN

Smith-Corona
PORTABLE TYPEWRITERS

MASTER CRAFTSMEN
use these finest fillers!



- SAVES TIME
- SMOOTH TEXTURE
- EASIER TO WORK
- SHRINKS ONLY 1%
- STAYS IN

FOR a perfect surfacing job on wood, metal or plastic—use the expert's choice—Duratite. Easy to use—faster—shrinkage is so slight, it fills completely in just *one* application—stays in! 7 wood colors. Ask your dealer or send for large tube.

WEBB PRODUCTS COMPANY

232 S. G St., San Bernardino, Calif.
Enclosed find 25c, send large tube Duratite Wood Dough.

Name _____
Address _____
City _____ Z _____ State _____

**SEND FOR
LARGE
TUBE**



FOR LARGE
CAVITIES

DURATITE

FOR SMALL
CAVITIES



WOOD DOUGH and SURFACING PUTTY

**You Can Be a Local
COLORCRETOR**



You can build a profitable, lifetime business with Colorcrete. Large waiting market. Work is easy and interesting. Moderate investment; high return. Large waiting market. Full instructions and liberal cooperation.

Sprayed-On Beauty

Colorcrete is modern beauty treatment for masonry surfaces—exterior and interior. Fuses to concrete, stucco, etc. Applied by air pressure. Range of many smart colors. Proven by 20 years of use on all kinds of buildings. Write or wire for Opportunity Book.

Colorcrete Industries, Inc.

572 Ottawa Ave., Holland, Mich.

**Outstanding
Business
Opportunity**



POWER ATTACHMENT

**FITS ANY SIZE OR MAKE
LAWN MOWER**

Requires
No Welding

This revolutionary new power attachment—for either gasoline engines or electric motor—is easily installed on any hand mower in less than one hour. Positive, chain drive and free wheeling. Thousands of enthusiastic users. Attachment only, complete with handle clutch, only \$27.80 F.O.B. Royal Oak.

MONEY BACK GUARANTEE

Our 1½-2 H.P., 4 cycle gasoline engine is air cooled and designed for rugged work plus easy, dependable starting. Has high and low adjustable jets. Hundreds of other uses when taken off mower.

Attachment and Engine are precision built for years of service. Both carry an absolute money back guarantee. Attachment and Engine only \$83.30 complete, F.O.B. Royal Oak, Michigan.

Orders filled in seven days

Write for illustrated folder today

ROYAL OAK LAWN MOWER SHOP

P. O. Box 48

Royal Oak 3, Michigan



Free
Folder

**DON'T PULL HAIR
FROM NOSE**

May Cause Fatal Infection

Use the **KLIPETTE** Rotating Scissors

REG. U.S. PAT. OFF.

You can cause serious infection by pulling hair from nose. Ordinary scissors are also dangerous and impracticable. No better way to remove hair from nose and ears than with KLIPETTE. Smooth, gentle, safe, efficient. Rounded points can't cut or prick skin.

So Simple! Just turn the end. Surplus hair clipped off gently, safely.

\$1 Made from fine Surgical Steel, Chromium plated—also in 24 Kt. Gold Plate in smart leather case at \$3.50 (plus 70c Fed. Tax)

Guaranteed to Satisfy or Money Back

HOLLIS CO. • 11 Commerce St., Newark 2, N. J. • Dept. 34-B

Enclosed is \$..... for..... KLIPETTE(S) at \$1 (no tax); in gold plate at \$3.50 (plus 70c Federal Tax). If not satisfied, I may return the above for refund in 10 days.

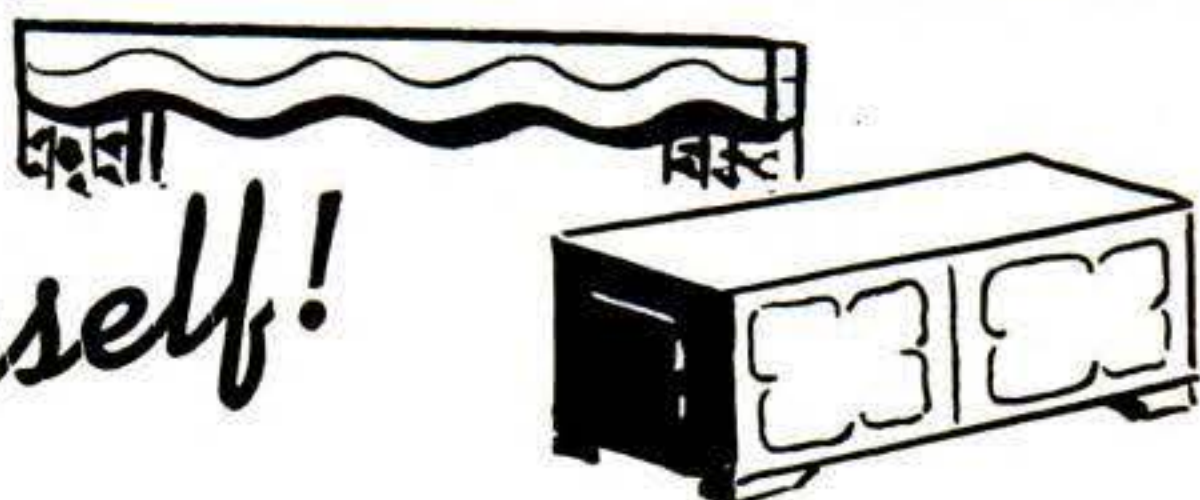
Name _____ Address _____

POWER-UP with POWER KING TOOLS

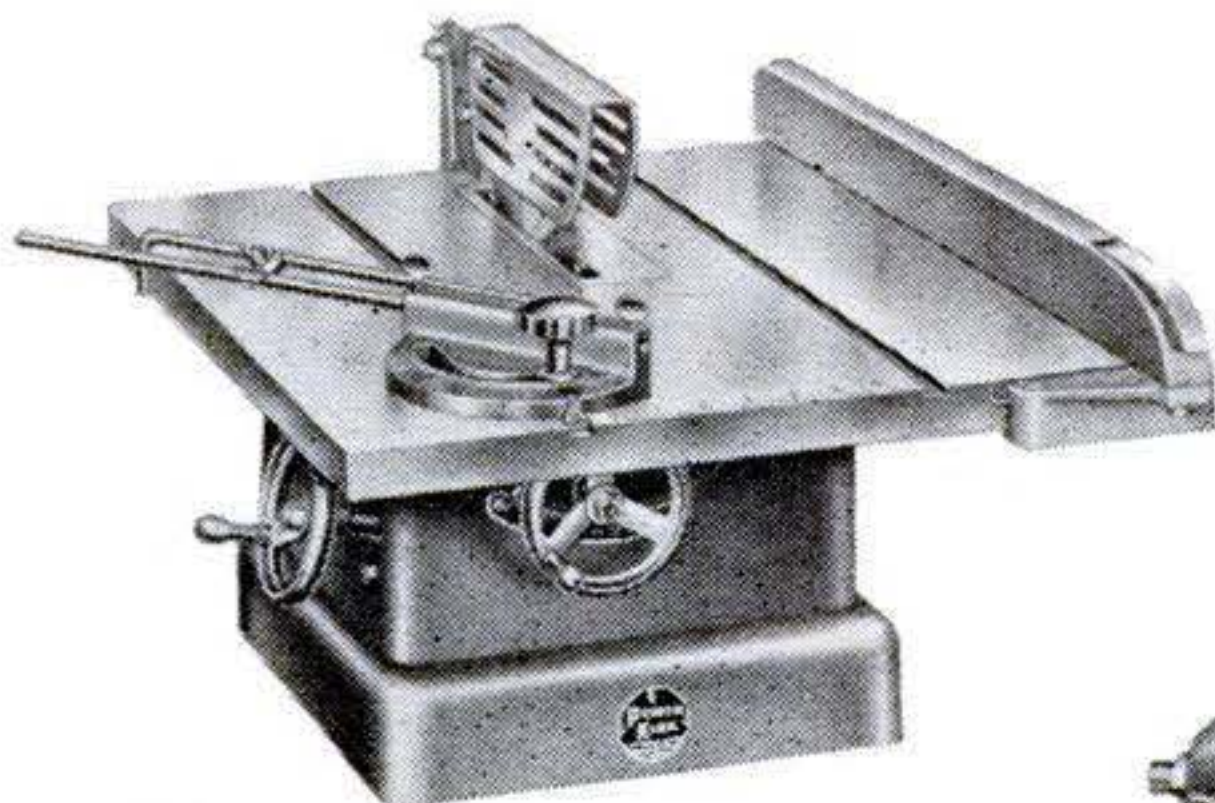
Save hundreds of dollars this year!



Build It Yourself!



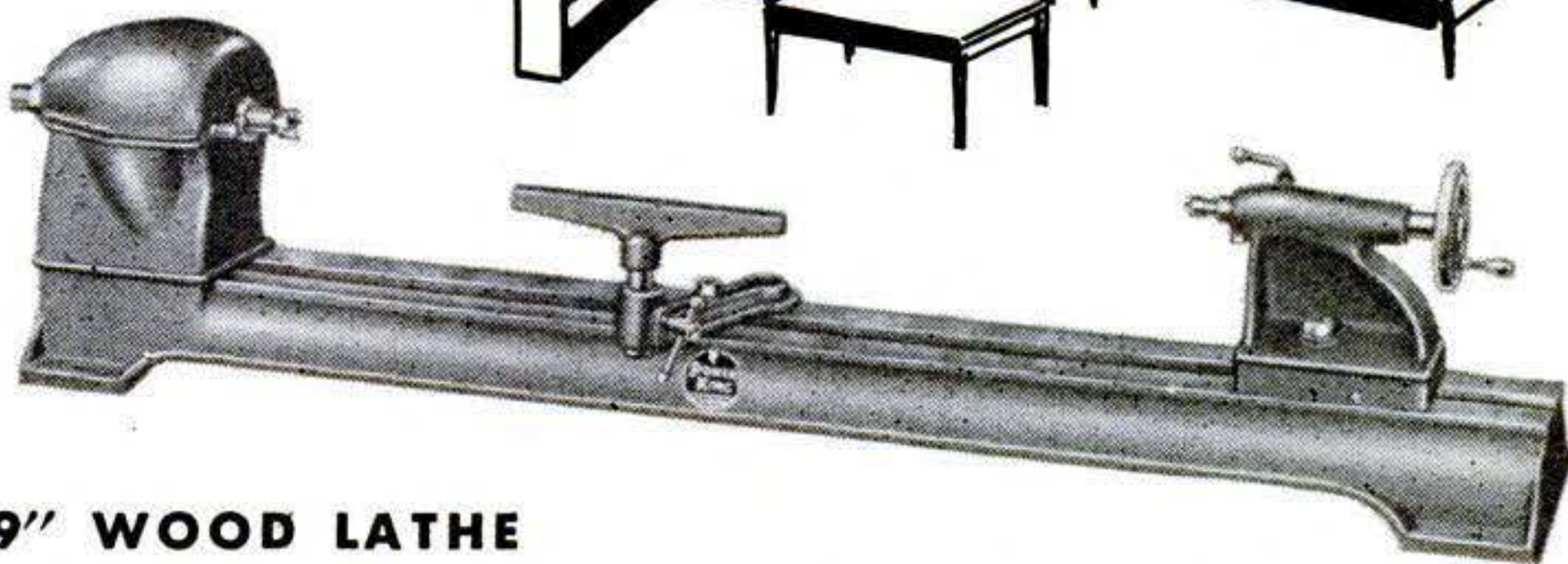
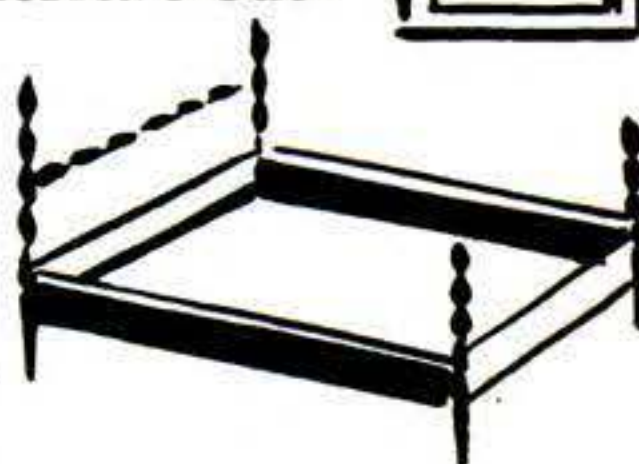
Mechanize your home shop . . . make it a real money-saver for you during these days of high prices. Shelves, cupboards, cabinets, tables, desks, beds, storm sash . . . you can make them — expertly and easily — with accurate Power King tools to speed your work. Power King tools are heavily built, with SKF ball bearings for smooth operation and lasting accuracy. They are America's outstanding low-cost tools!



8" TILT/ARBOR SAW

Basic tool for your shop is this 8" Tilt/Arbor Saw. Its 18" x 20" precision-ground table has 8 1/4" between blade and fence—10 5/8" area ahead of blade, which cuts 2 5/8" deep. Blade tilts 45°. Table is always flat so your work can't slide into saw on angle cuts. New type rigid fence locks at both ends, releases instantly for positioning. Table graduated in 1/16ths. Arbor runs on SKF ball bearings for long lived accuracy. An exceptional bargain . . . **\$61.75**

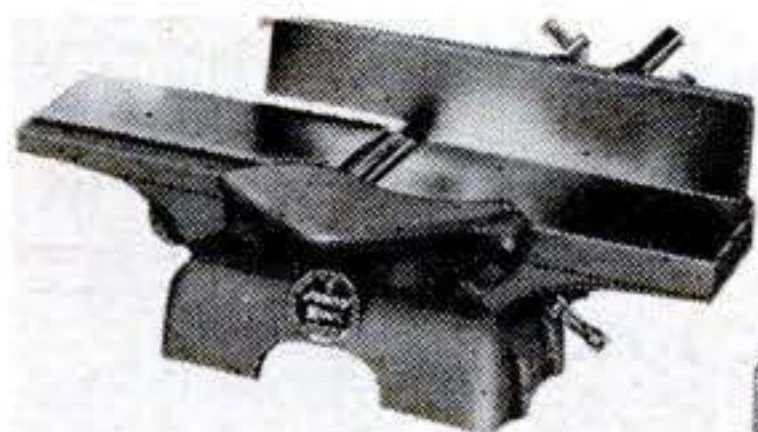
Price F.O.B. Kalamazoo, less motor



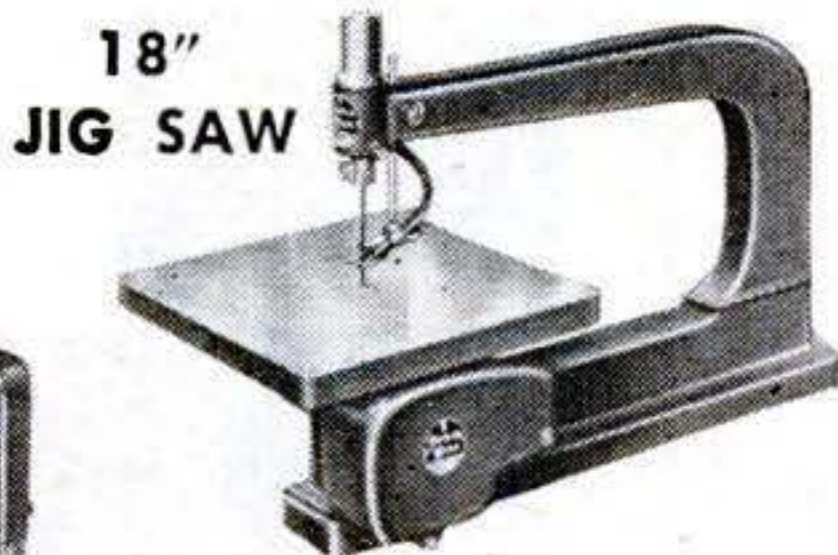
9" WOOD LATHE

Typical of Power King engineering is this new 9" wood lathe. It has the rigidity to handle your most exacting work. Bed is a heavy cross-braced semi-steel grey-iron casting. Headstock and tailstock are also grey-iron castings. Takes 30" between centers. Handles inboard and outboard turning. You'll find no better value anywhere at its low price — **\$39.75**

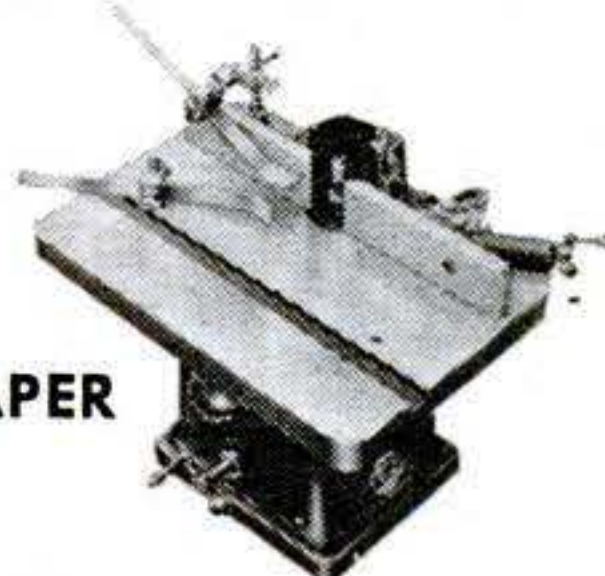
Price F.O.B. Kalamazoo, Michigan, less motor



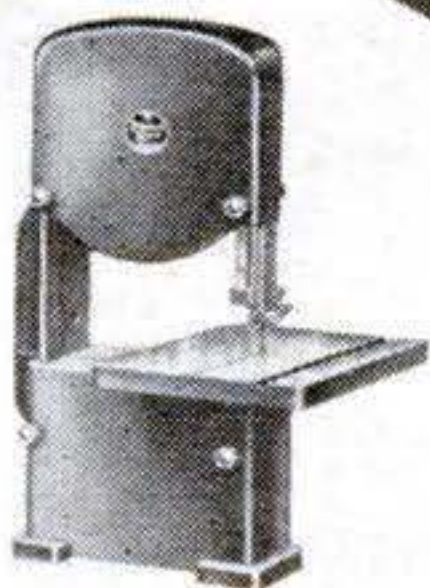
4 1/2" JOINTER-PLANNER



18" JIG SAW



SHAPER



12" BAND SAW



BELT AND DISC SANDER



11 3/4" DRILL PRESS



NEW FREE CATALOG!

Send today for illustrated catalog of new low-cost Power King tools. Your name and address on a penny postcard will bring it.

ATLAS PRESS CO.

1142 North Pitcher Street
KALAMAZOO, MICHIGAN



MATCHED PRECISION TOOLS FOR WOODWORKING AND METALWORKING



Gifts Supreme BY Lenk

THE HOME OWNER, THE HOBBYIST, THE MECHANIC

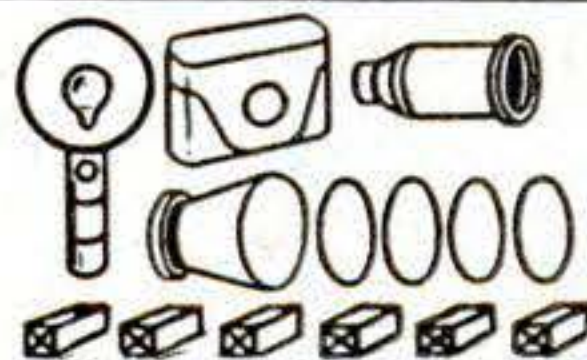
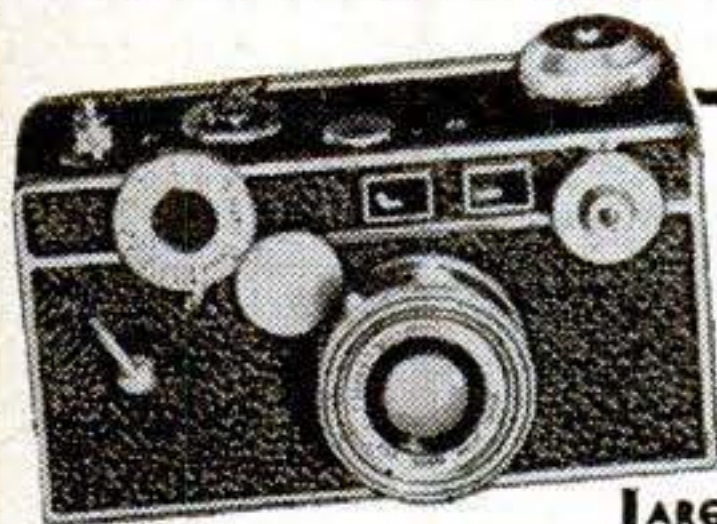
Here's the very best in home workshop equipment. These and other superior quality Lenk items hand-somely gift-wrapped, ready at your dealer's:

- LENK GUN-GRIP ELECTRIC SOLDERING IRON \$5.00
- LENK WORKSHOP KIT (soldering iron, bltorch, solder) 4.00
- LENK SELF-GENERATING BLOTORCH (ALCOHOL TYPE 3.25)
(GASOLINE TYPE 3.00)

If your dealer is out of stock, send check or money order to us (mention dealer's name).

THE Lenk MFG. COMPANY
30-38 CUMMINGTON ST., BOSTON 15, MASS.

**SAVE \$51.36 ON NEW
ARGUS C3 OUTFIT**
ALL THIS FOR ONLY \$99.50



Yes! A regular \$150.86 complete outfit for only \$99.50. THE GENERAL'S New Money Saving Outfit includes EVERYTHING you need for perfect results — at a Huge Saving from the regularly advertised list price.

ARGUS C3 with F/3.5 coated lens and built-in range finder and flash gun	\$69.58
Argus Carrying Case	8.50
Telephoto Lens	49.50
Sunshade and Filter Holder	4.50
4 Filters @ \$2.25	9.00
6 Rolls Eastman or Ansco Film @ \$1.08	6.48
1 Roll Kodachrome Film	3.30

Buy Now — Pay Later
On The General's
"PAY-AS-YOU-SHOOT" Plan
Order This Easy Way

Nationally Advertised
LIST PRICE: \$150.86

**ALL BRAND NEW
FOR ONLY \$99.50—\$9.95 Down**

Trade-Ins Accepted as Down Payments

Mail your order, down payment (not less than 10%), short note about yourself and two references. In a few days your ready-to-use ARGUS C3 OUTFIT will be on its way to you.

10-DAY FREE TRIAL

Order your Argus C3 Outfit today and if within 10 days you are not satisfied, return for full cash refund.

THE GENERAL CAMERA COMPANY
Mail Order Division, Dept. PC, Chicago 45, Ill.

NEW Pocket MICROSCOPE

Locks at 20X-40X-60X..... **\$14.50**

BUILT-IN "LIGHT-SCOPE" for concentrating light. 3 different magnifications. 20, 40 and 60 power, instantly, at the flick of a finger. Ring type fine focusing control.



Same high accuracy as the laboratory type microscope, but far more convenient—for use in factory, show-room, field. Requires no slides, no pre-arranged conditions, no special light source. Normal daylight or artificial light suffices. A compound microscope with precision ground and polished lenses, hard-coated to admit more light, reduce glare and eliminate reflection. Full, flat field of vision. 5 1/4" long (closed), weight 3 oz. Life-time baked enamel and triple-chrome plated finish. Handsome pocket carrying case included. Makes a Welcome and Useful Xmas Gift. **\$14.50**
Mailed postpaid for only.....

SCHOENIG & CO., Inc.
Dept. PS. 9 Rockefeller Plaza, New York 20, N. Y.

NEW FLUORESCENT FIXTURE with GE CIRCLINE LAMP!



GUARANTEED FOR 1 YEAR!

A strikingly beautiful fixture in polished aluminum finish. Suitable for every room. Model C-32AP (illustrated), \$9.50. Model C-32S with etched glass shade, \$12. Sent POSTPAID anywhere in the U. S. upon receipt of cash order. C. O. D.'s sent F. O. B. factory. Write for free literature on full line.

HANOVER LIGHTING SALES
Box 186, Dept. ME, Hanover, Pa.

\$8.95
POSTPAID



NOW! FILE YOUR OWN SAWS

Do expert saw filing at home. Precision filing easy without experience. Two simple adjustments. Keeps any hand saw extra sharp and true-cutting. Complete with file. Money back guarantee. Cash with order, prepaid. (COD postage extra.) Order today.

THE SPEED CORP., Dept. PS
2025 N. E. Sandy, Portland 12, Oregon



DO LATHE JOBS on DRILL PRESS with DRILLATHE

\$2.50 Postpaid

A rugged tool that converts drill press into lathe. Precision made of cast aluminum. Comes complete with high speed tool bit. Money back guarantee. Send \$2.50—wepay postage.

Surface or Bench Plate only \$3.50

6" square—C.I.—weighs 6 lbs., surface ground to .001 flatness. Money back guarantee. Send \$3.50, postage collect.

BRAEMER PRODUCTS • Box 2636 • Lakewood, Ohio

\$295 REAL DIESEL ENGINE



A real diesel engine, complete with cylinder and piston, carburetor, crankshaft and connecting rod. All parts completely machined. ready for easy assembly ONLY \$2.95. We're selling thousands of DEEZILS. So production's up; costs tumble down. DEEZIL is a precision engine. Actually runs at 7500 RPM. Produces 1/7 HP. Ideal for planes, boats, midget cars. Send \$2.95 plus 15c postage today

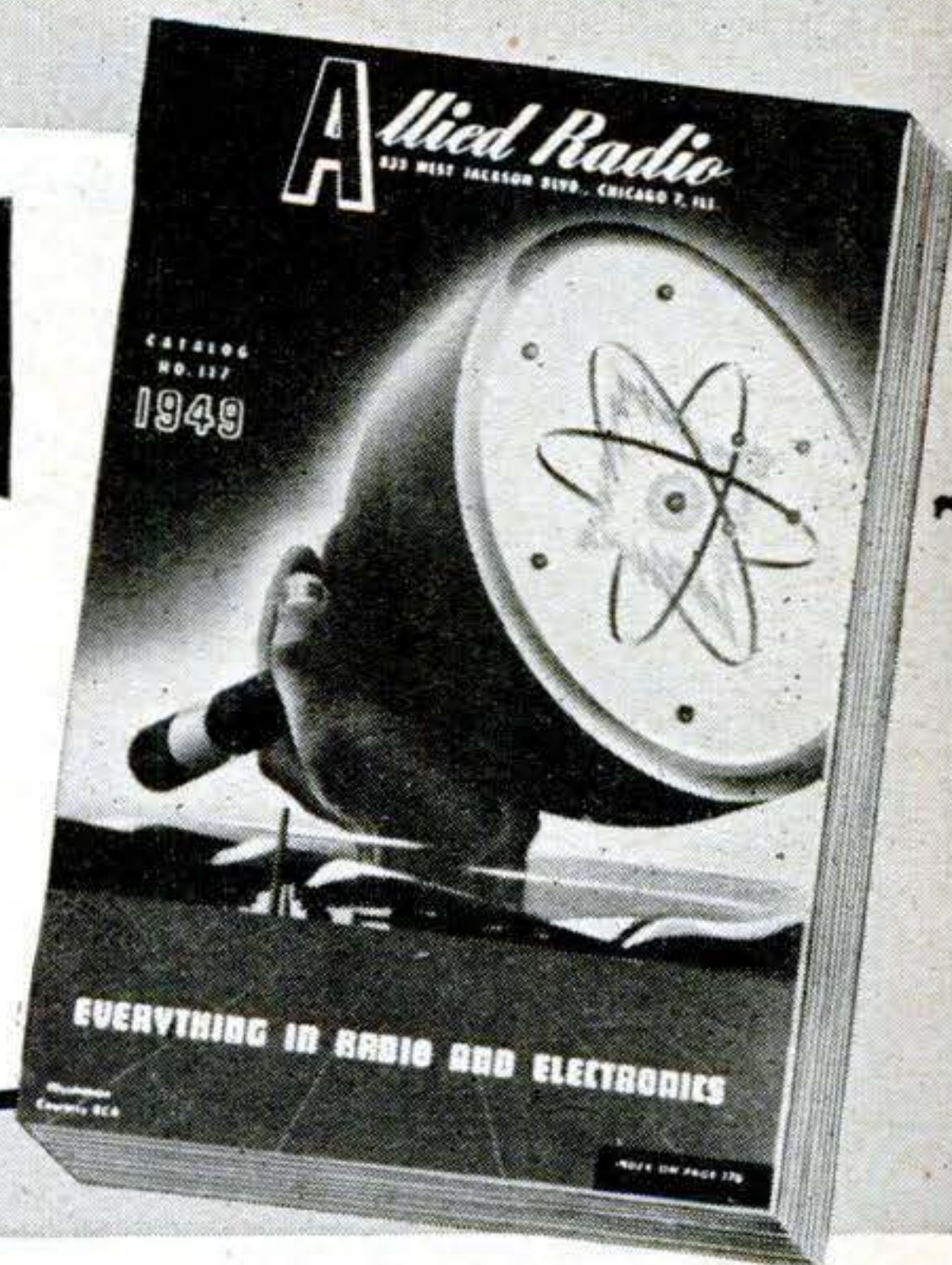
GOTHAM HOBBY CORP.

107 East 126th Street Dept. "S" New York 35, N. Y.

ALLIED'S NEW **FREE** 1949 RADIO CATALOG

180 VALUE-PACKED PAGES

Send for it now!

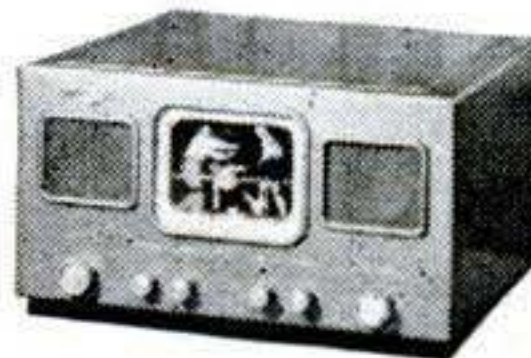


The Preferred Radio Buying Guide

It's ready for you—the new 1949 ALLIED Radio Catalog! Get the Radio Buying Guide that's the first choice of thousands of expert service technicians, engineers, soundmen, Amateurs, builders and experimenters. The new ALLIED Catalog—Radio's largest and most complete—brings you 180 pages packed with the widest selections of the newest and finest equipment, at today's lowest, money-saving prices! Here's everything in radio for everyone in radio: new Television and home receivers; radio-phonos with new Dual-Speed Changers; packaged Sound Systems, high-fidelity sound components and P. A. equipment; latest Amateur receivers and station gear; test instruments; builders' kits; thousands of parts, tubes, tools, books—the world's largest and finest stocks of nationally known equipment. Take advantage of ALLIED's speedy, expert shipment and the personal attention of seasoned old-time radio men. Get the details, too, of radio's most liberal Time Payment Plan. Write today for your FREE copy of ALLIED's newest and greatest Catalog—the preferred Radio Buying Guide!

LARGEST STOCKS • QUICK, EXPERT SERVICE

**Send for your FREE copy of
Radio's Most Complete Catalog.
Use the coupon below — NOW!**



WORLD'S LARGEST STOCKS

Everything in radio for everyone in radio! ALLIED's huge stocks are the world's largest, including complete lines of all leading makes of parts and equipment. Get everything you need from one dependable centralized source—ALLIED RADIO!

TELEVISION & HOME RADIOS

See ALLIED'S outstanding selection of new Television sets, new table model radios, FM-AM combinations with new Dual-Speed Automatic Changers. Save on these radio models—the choice of experts!

AMATEUR STATION GEAR

You'll find everything you need for your shack in the new ALLIED Catalog. See all the latest releases in receivers, transmitters, parts, station equipment—the biggest and most complete listings in Ham radio!

NEW SOUND EQUIPMENT

Packaged, ready-to-use Sound Systems; amplifiers guaranteed for one full year; high-fidelity sound components; everything in speakers, mikes, P. A. accessories, intercom and recording equipment—headquarters for Soundmen!

**Radio's Leading
Buying Guide . . .**



**THE WORLD'S
LARGEST
RADIO
SUPPLY
HOUSE . . .**



**ALLIED
RADIO**

*Everything in Radio
and Electronics*

**ALLIED RADIO CORP.
833 W. Jackson Blvd., Dept. 7-L8
Chicago 7, Illinois**

☐ Send FREE New 1949 ALLIED Catalog.

Name.....

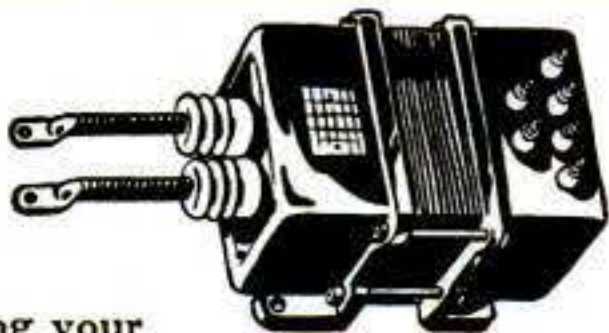
Address.....

City.....Zone.....State.....

WAR SURPLUS BARGAINS — BY MAIL!

Build Your Own SPOT WELDER

Brand New
Transformer Unit **\$18.95**



Perfect as the basic unit for building your own low voltage, high amperage spot welder to operate on house current—or FOR THAWING FROZEN WATER PIPES. Output, 190 amps at 5 volts. Momentary output, 1000 amps or more. For home workshops, industrial plants, garages, 100's of other uses. Original gov't cost, \$160. Shipping wt. 100 lbs. Welding info. furnished FREE!

NEW MIKES, \$1 ea. or 2 for \$1.75

Brand new, AAF type midget size carbon microphone. Wonderful for telephones. Free instructions. Shipping wt. 4 ozs.

1 1/2 HP SWITCH .89c

Single hole mounting. Chrome bat. handle. D.P.S.T. Perfect for shop motors, hvy. duty appliances. Small size. Rated 25 amps. Reg. \$2.60. Shipping wt. 8 ozs.



NEW TRANSFORMERS.....\$12.95

Kenyon, 20 taps to give wide range of output voltages. Actually 10 transformers in 1—for 100's of uses where various voltages are needed to test or operate electric equipment. Input, 110 V. Gov't. cost, appr. \$50. Shp. Wt., 20 lbs.

\$6.50 BLOCKS only \$2.95

Dbie, pulley, all steel shell. Bronze bushed. Hvy. duty with forged hook. Saves heavy lifting. Brand new. Shp. Wt., 4 lbs.

THREAD GAGE 89c

Tells instantly number of threads of any screw, 4 to 42 per inch. Brand new. Famed Miller Falls brand. Shipping wt. 1 lb.

ORIG. \$84 ELECTRIC GEAR MOTOR, \$4.50



4-lb., 1/8 HP motor with magnetic clutch, reverse. Ideal for sander, polisher, barbe-cue spits, antennas. Hi-torque @ 35 RPM. 24 V. Full instructions.

CIRCUIT BREAKER

\$1.49

Prevents blown fuses, burning motors. Shorts & overloads shut off current. 115 V in 5, 10, 15, 20, 25, 30, 35, 50 amps. sizes. Shp. Wt. 2 lbs.

Send check, money order or postal note. Heavy items shipped fast truck freight or express, charges collect. Add postage on all others. C.O.D.'s acceptable—no deposit required. Minimum Order \$2.50 please.

METAL MATERIALS CO., Dept. P-1
3923 Van Buren Culver City, Calif.



WHEELS

Spotwelded Heavy Gauge Steel LOWER PRICES!

5"—5/8" solid tire, 3/8 bushing, ea.....\$.49

8" with 1" solid tire—

—1/2" OR 3/8" steel bearing, ea..... 1.00

—with 1/2" KILIAN Ball B'R'GS, ea... 1.25

10" with 1/2" KILIAN BALL B'R'GS,

and 1.75 semi-pneumatic tire, ea.... 2.20

ADD 10% to ALL prices for P.P.; 15% West of Miss. Send check or money order only. We guarantee satisfaction. Mail order NOW!

C. W. YOUNG MFG. CORP.

208 Burnet Ave. Syracuse, N. Y.

CARBURETOR TOO RICH MAKES MOTORIST TOO POOR



Car owners who are wasting money and not getting proper gas mileage due to over-rich mixtures will be pleased to learn how to save gasoline by VACU-MATING over-rich mixtures. VACU-MATIC fits all cars, trucks and tractors. It is automatic and operates on the supercharge principle. Easily installed in a few minutes.

SALESMEN WANTED! Big Profits!

Send name, address on penny postcard for free particulars and how to get yours for introducing.

VACU-MATIC CO., 7617-1406 W. State St., WAUWATOSA, WIS.

A GIFT THAT "CLICKS" AT XMAS ASSEMBLE THIS CLOCK for ONLY \$3.95

IT'S FUN—IT'S EASY—IT'S INSTRUCTIVE
(A small screwdriver is the only tool required.)
Complete, Ready to Assemble—Accurate—Lasts for Years
Exquisite Design—Ebony Black Plastic Case

See what makes a clock "tick." See how smart you are mechanically by timing yourself as you assemble this beautiful, weight driven pendulum clock which you can't buy in finished form in stores for twice the price.

You save all assembly costs. Makes ideal Xmas gift, remembered always.

WILCOX, INC., Dept. S-11, 971 Goodrich Blvd.
Los Angeles 22, Calif.

LAW STUDY AT HOME for Business Success and LARGER PERSONAL EARNINGS. 39 years expert instruction—over 114,000 students enrolled. LL.B. Degree awarded. All text material furnished. Easy payment plan. Send for FREE BOOK NOW—"Law and Executive Guidance."

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 95-PS, 646 N. Michigan Ave., Chicago 11, Ill.

Quality HAND DRILLS

Money-back Guarantee. Send check or money-order—no C.O.D.'s.

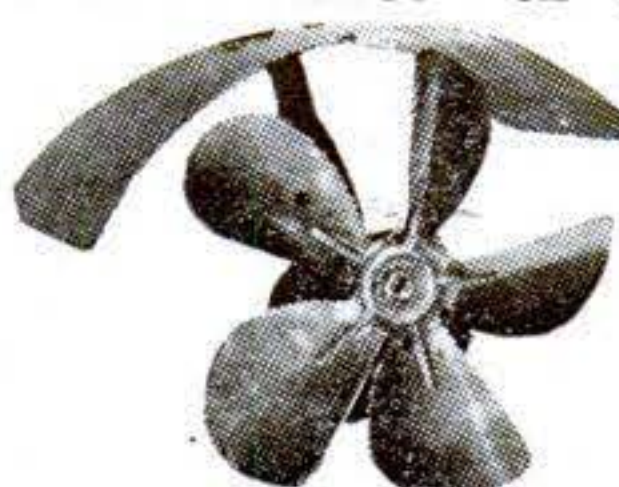
\$2.98

Postpaid in U.S.A.

Completely enclosed precision gears. Lightweight aluminum housing. Hardened steel chuck. Polished walnut handle. Takes straight shank drills to 1/4". AN IDEAL GIFT!

PENINSULAR MFG. CO.
119 E. Washington Ave.
Jackson Michigan

For Hard-to-Heat Rooms



Install this 7" Booster Fan in a few minutes with snips and screw driver—throws extra heat to cold room. Furnished assembled to curved mounting brim 6" x 10" for simple fastening with 2 metal screws. Quiet motor has 4 ft. cord and plug. Fan delivers 300 cu. ft. min. Complete instructions furnished. Only \$8.45 each. Send check or money-order today, no C.O.D.'s. Money-back guarantee.

NESTER METAL PRODUCTS
Dept. PS ALBION, MICH.

DUAL TAIL PIPE EXTENSION

Fits all cars—chrome plated
DEEP TONE

\$2.95

produced by 2 1/2 inch outlets
Postage free on prepaid orders

DEALER INQUIRIES INVITED

LYONS PRODUCTS COMPANY

Pat. Pend. 2426 South LaBrea, Dept. PS-11, Los Angeles 16, Calif

WHY PAY MORE? ...

Amazing 5-in-1 Shop
ONLY \$39.95 COMPLETE

Wonderful Christmas Gift

Yes, you get a Lathe, Saw, Drill Press, Grinder and Sander, when you buy an Emrick 5-in-1 Shop. All tools quickly interchangeable. All capable of big, heavy-duty work.

The Emrick machine takes 1/4 to 1/2 h.p. motor—equals in performance equipment costing up to 8 times more. Ideal for handling home repairs, running a money-making business. You can work in wood, metals or plastics. Thousands of satisfied customers ... our 50th year.

Give an Emrick this Christmas—make someone very happy. Buy one for your own pleasure and profit. Use coupon now, or write us.

MONEY-BACK GUARANTEE

EMRICK, INC., 1761 Clinton, Kalamazoo, Mich.

☐ I enclose \$18.00. Ship Emrick Workshop (complete less motor and saw blade) on balance c.o.d. basis. Unless completely satisfied, I may return within 10 days and get my money back.

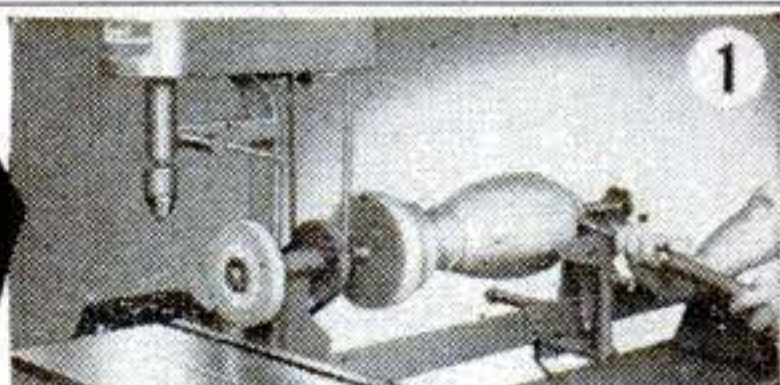
Name _____ (PLEASE PRINT)

☐ Send FREE catalog.

Street _____

City _____

State _____



LATHE—excellent power tool; handles big, heavy work; 30" between centers; 10" swing; bronze replaceable bearings; wide speed range.



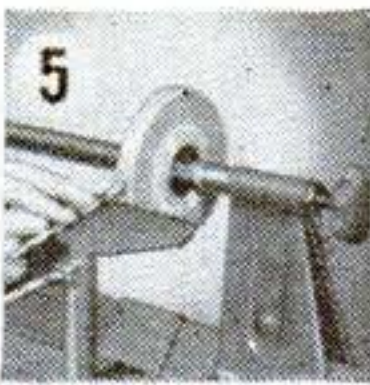
DRILL PRESS—heavy-duty performance; pulls 1/2" drill in steel; 2" travel.



SAW—handles heavy ripping and cutting; takes 6, 7 or 8" dia. blade.



SANDER—gives your work professional finish; swell for shaping plastic; 8" dia. disc.

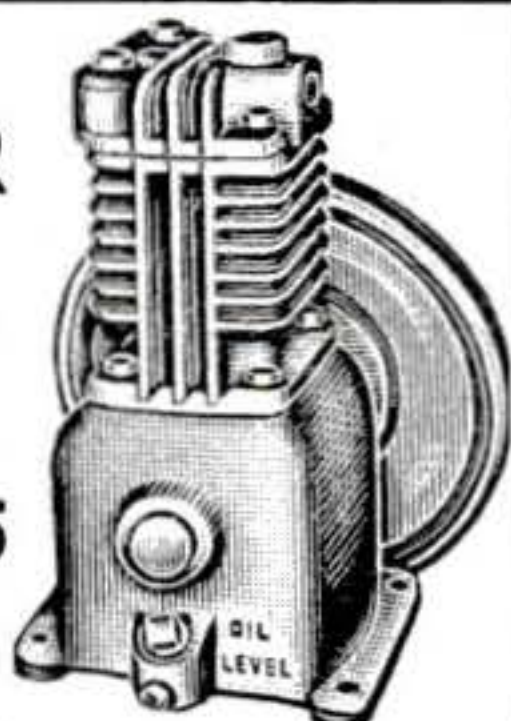


GRINDER—for sharpening your tools; grinding metal; polishing; 5" dia. wheel.

PISTON TYPE AIR COMPRESSOR

Piston type, size 2 x 1 3/4, head in valves, bronze bearings, splash lubrication, "V" Belt drive, Intake muffler and cleaner. Capacity 2.8 c.f.m. at 100 lbs. continuous pressure or 150 lbs. Intermittent, with 1/2 HP motor. Can be used with 1/4 HP or 1/2 HP at lower speed. Weight 14 lbs. Operating instructions furnished.

Immediate delivery. **\$17.95**
Price only



1/4" REDUCING VALVE & GAUGE

Oil resistant, pressure 0-to-200 lb. Reduced pressure 0-to-75 lb.; 3 outlets 1/4". Wt. 2 lbs. **\$5.75**



POP TYPE VALVES

Has a close range of closing after pop-off pressure is reached. 1/4" pipe thread. Only **\$1.50**

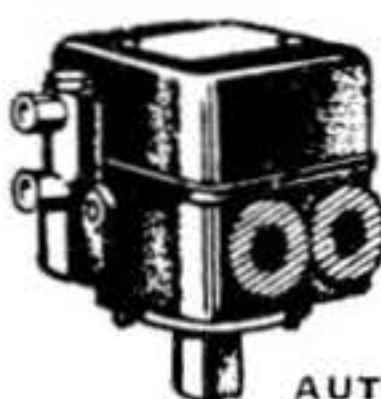
CHECK VALVES

Prevent leakage after compressor stops. 1/4" **\$2.75**
1/2" **\$4.75**



AIR GAUGE—2 1/2"

0 to 200 lb. Pressure **\$1.75**
Heavy Duty Motors 1/4 to 1 1/2 H.P.



AUTOMATIC PRESSURE SWITCH WITH UNLOADER

125-150 lb. pressure. Uses 1/4 to 5 H.P. unit.

Only **\$8.95**

only **\$8.95**

F.O.B. CHICAGO. SOLD ON MONEY BACK GUARANTEE. Send check or money order today. Write for free folder.

C & M EQUIPMENT COMPANY

1831 S. State St., Dept. B-11, Chicago 16, Ill.

SAVE! on POST LAMPS!

NEW DELUXE KITS

bring beautiful colonial post lamps in reach of all. 16" high, 10" square. 3" post diam. Complete instructions.

These rugged lamps make ideal gifts.

Kit No. 1 you solder frame. \$7.95 ea.

Kit No. 2 you assemble with screwdriver, paint. \$9.95 ea.

Complete Lamp ready to install, less bulb, **\$14.95.**

Postage prepaid, money-back guarantee. Send check or money order or ask for free literature. **LORENZEN INDUSTRIES, Dept. PS-11, Niles, Mich.**

SMOOTHER ENGINE PERFORMANCE WITH 10% TO 15% LESS GASOLINE

Atomjet ATOMizes gasoline for complete combustion—reduces oil consumption, eliminates carbon, cuts repair bills. Engine runs cooler, parts last longer. Fool-proof, easily installed. \$3.95 postpaid. Ohio orders add 3% sales tax.

Jet Sales Co., 2519 Fulton Rd., Canton 7, Ohio



CASH IN ON THE BUILDING BOOM

Only **\$199**

Amazing, General High-Speed low cost Concrete Vibrator Block Machine. Will produce 1000 blocks in an 8 hour day. All sizes. Easy to start your own profitable business. Complete details sent FREE. Mail \$1 for WONDERFUL BOOK "How To Build Your Own Concrete Block Home."

GENERAL ENGINES CO.

(EASTERN DIVISION) DEPT. H • DREXEL BLDG., PHILA. 6, PA.



PRICE
\$280
(shipped prepaid)



The Original E-Z DRILL SHARPENING FIXTURE

(PAT. NO. 2,411,609)

Sharpens drills 3/32" to 1 1/2" dia. to factory precision in 30 seconds. Made of cold rolled steel (no pot metal). Aluminum protractor. Production or home workshop.

E-Z MFG. CO. 4408 San Fernando Rd. Glendale 4, Calif.

HANDEE Homecrafters' Choice

This is it—the famous Tool of 1001 Uses — first tool of this type and today's finest. It's the tool for you whether you're an eager beginner or an expert.

GRINDS
DRILLS
CARVES
SANDS
SAWS
SHARPENS
POLISHES
ENGRAVES



FREE
64-Page
Manual

There's Only One
GENUINE HANDEE

FOR PLEASURE OR PROFIT

You'll enjoy making ship, train and plane models, puppets, costume jewelry, wood carvings, bookends. You'll engrave monograms on glassware, tool leather billfolds, handbags, etc. And it's a dandy for all kinds of repairs. Used by industry for exacting production jobs—preferred by craftsmen and mechanics.

EASY TO USE as a pencil. Fits your hand comfortably. Lightweight, only 12 ozs.

WORKS ON ANY MATERIAL. Metal, alloy, glass, plastics, wood, horn, bone, leather, etc.

PACKED WITH POWER AND SPEED. Runs at a cool 25,000 r.p.m. AC or DC current.

DESIGNED RIGHT in every detail—result of 50 years' experience. Close-fitting motor, non-breakable housing, 7-segment commutator, interchangeable spring collet clutch. Every part triple-tested to make Handee the perfect tool. With 7 accessories \$20.50. In carrying case with 40 accessories \$27.50.

PLASTIC-CRAFT KIT. All materials needed for internal carving (Handee not included) \$6.95.

500 ACCESSORIES. Start with a few, add more as needed.

GET AT STORES OR SENT POSTPAID

CHICAGO WHEEL & MFG. CO.

1101 W. Monroe St., Dept. PO, Chicago 7, Ill.

Send ☐ Handee Kit ☐ Handee Tool ☐ Plastic-Craft Kit
☐ C.O.D. ☐ Remittance enclosed ☐ Send Manual

Name.....

Address.....

What Science
now knows
may help you...

HEAR BETTER



Get the answers to your questions—plus many interesting and encouraging facts about your hearing—in a new booklet now available to you without cost, called “Modern Science and Your Hearing.” Prepared with the help of scientists at Bell Telephone Laboratories, it is published by Western Electric. Mail coupon for your free copy.

MAIL COUPON TODAY

Western Electric Dept. 380-PS11

195 Broadway, New York 7, N. Y.

Send free copy of “Modern Science and Your Hearing.” Also booklet on two new all-in-one Western Electric Hearing Aids.

Name _____

Address _____

City _____ State _____



Rack Holds Garbage Can

NEITHER prowling dogs nor wintry winds can overturn a garbage can held by the elevated rack shown above. Since it rotates on the supporting post, the rack can be installed to swing over a fence for collection. Called the Garba-vator®, it's made by Highland Industries, Inc., of Denver.

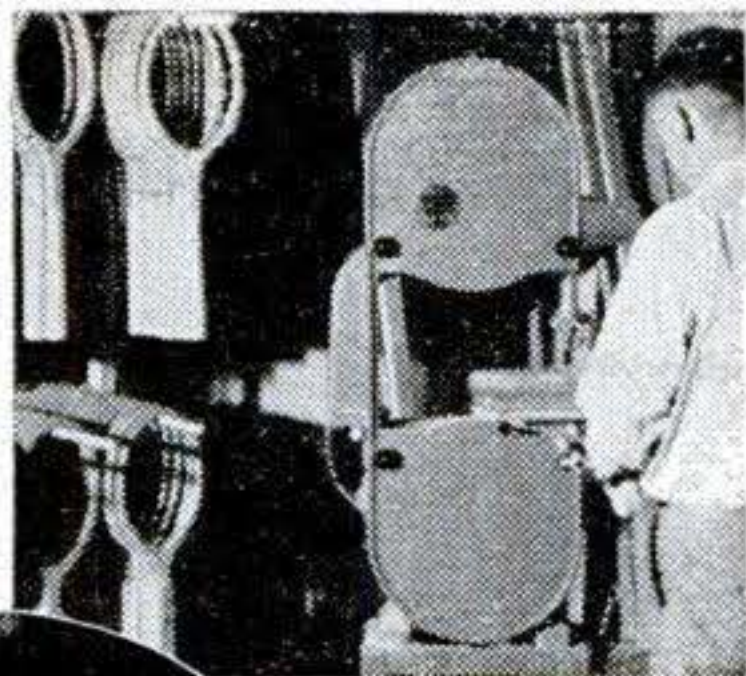


Warmer Works In Car

THIS new electric bottle warmer simplifies the problem of feeding Junior on long auto trips. Plugged into the dashboard cigarette lighter and hung from any handy knob, it warms a bottle of milk or a can of baby food in about eight minutes.



This Delta Shaper stands up under constant use, turning out furniture parts fast and accurately.



A Delta 14" Wood-cutting Band Saw sawing tennis racquet frames. (Metal-cutting model available, also.)



A Delta Unisaw* at the job-site saves time and cuts costs for this builder.



A Delta 12" Lathe helps this pattern maker do a better job with greater economy.

This Delta Sander cuts costs for finishing, mitering, and squaring of moulded plastic products.

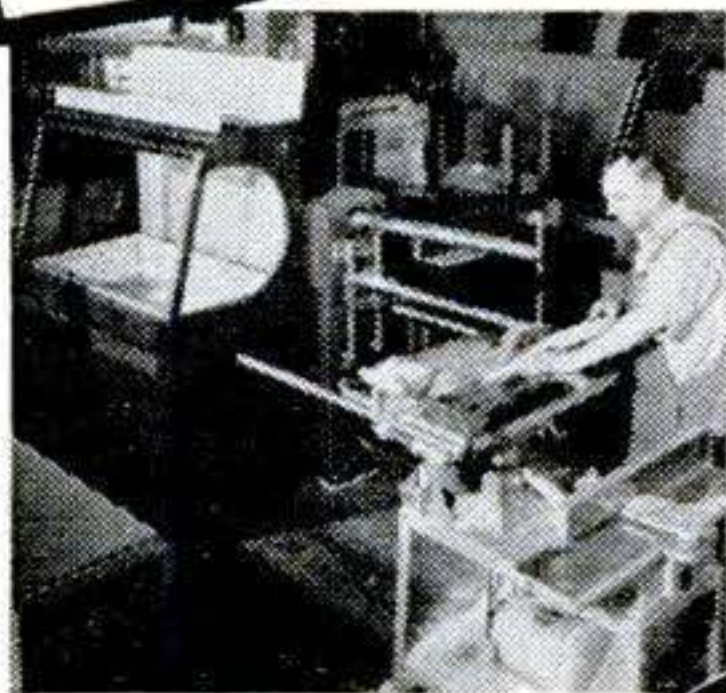
DELTA MILWAUKEE®

Many companies use Delta-Milwaukee Machine Tools to build and repair these and other products:

Accordions
Adding Machines
Advertising Displays
Air Conditioners
Aluminum Products
Archery Supplies
Artificial Limbs
Asbestos Products
Athletic Goods
Bar Fixtures
Barn Equipment
Batteries
Bicycles
Boats
Coin Machines
Dairy Supplies
Doors
Electrical Equipment
Farm Implements
Furniture
Hardware
Interior Woodwork
Kitchen Cabinets
Laundry Equipment
Lighting Fixtures

Metal Specialties
Millwork
Mouldings
Musical Instruments
Novelties
Organs
Ornamental Bronze
Outboard Motors
Picture Frames
Pipes
Plastic Products
Plumbing Supplies
Rubber Goods
Sash and Trim
Screens
Sheet Metal Products
Signs
Stairs
Store Fixtures
Storm Sash
Tavern Equipment
Toys
Truck Bodies
Venetian Blinds
Woodenware

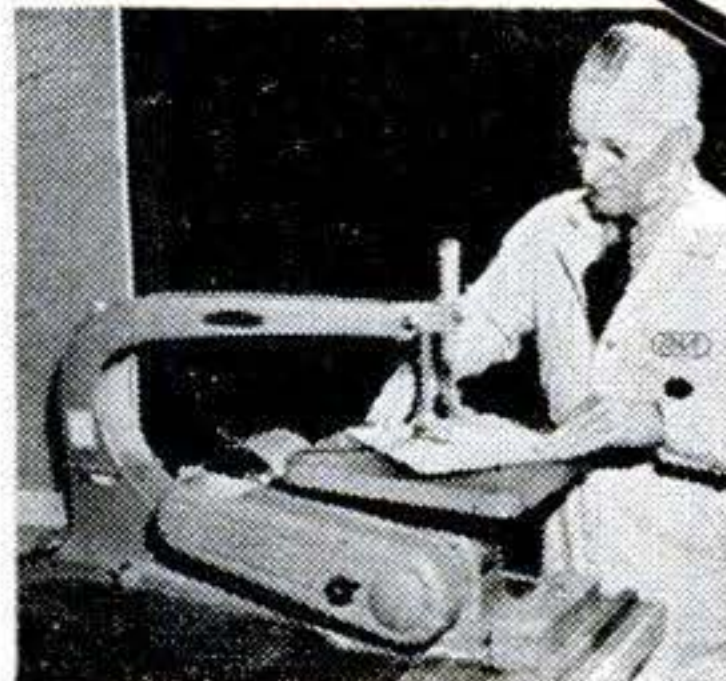
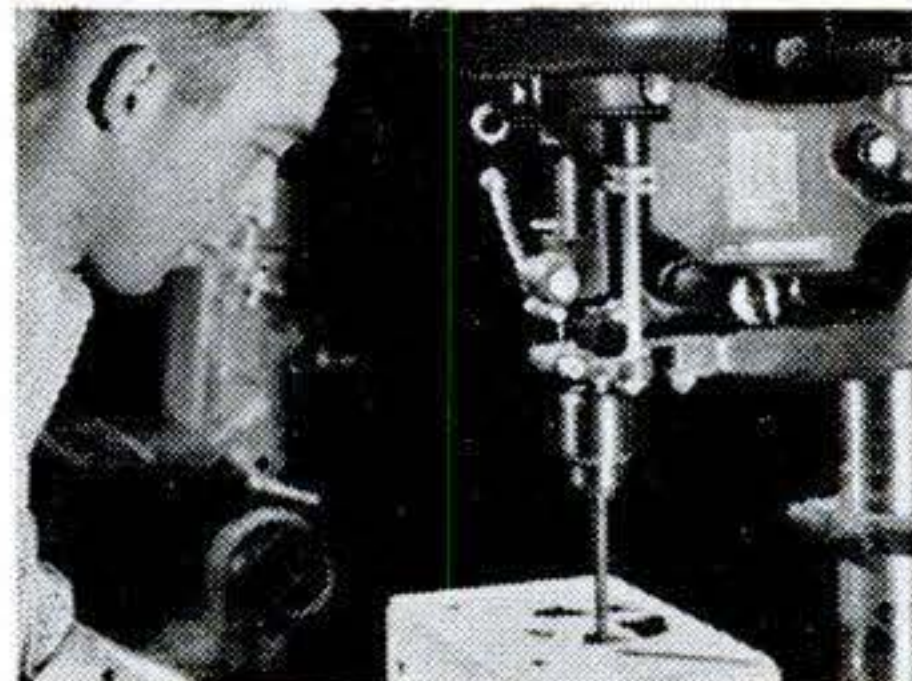
Profitably used by
Blacksmiths
Boat Builders
Body Shops
Cabinet Makers
Carpenters
Contractors
Coppersmiths
Die Makers
Display Companies
Garages
Model Builders
Pattern Makers
Sign Shops
Tool Makers
Upholsterers
Wood Turners
Hobbyists
—and many others.



Above: This Delta-Saw-Jointer Combination saves space, time, and money for a manufacturer of store fixtures — both in the shop and out of it on installation jobs.

Below: This Delta Scroll Saw is used for airplane maintenance work.

Here a Delta 14" Drill Press makes holes for radio control shafts and speaker grill.



The flexibility and low cost of DELTA-MILWAUKEE® MACHINE TOOLS save you time and money

—in working hardwood, softwood, plywood, builders board, plastic, non-ferrous metals

They cost less to buy! You save money, because Delta mass-produces a large volume of standard models.

They cost less to run! You save money on power — and on replacement parts.

They're compact and portable! You can put Delta-Milwaukee Power Tools *where* you need them, *when* you need them.

Delta-Milwaukee Machine Tools are safe, accurate, and dependable. That's why they're the choice of many businesses (of schools and home shops, too). Have your nearby Delta distributor show you the complete line and explain the advantages *you* can enjoy.



Look for the name of your Delta distributor under "Tools" in the classified section of your telephone directory.

Send for free catalog!

TEAR OUT COUPON AND MAIL TODAY!



DELTA MANUFACTURING DIVISION
ROCKWELL MANUFACTURING CO.
683M E. Vienna Avenue
Milwaukee 1, Wisconsin

Send me free copy of Delta-Milwaukee Catalog B-48.

Name_____

Title_____

Company_____

Address_____

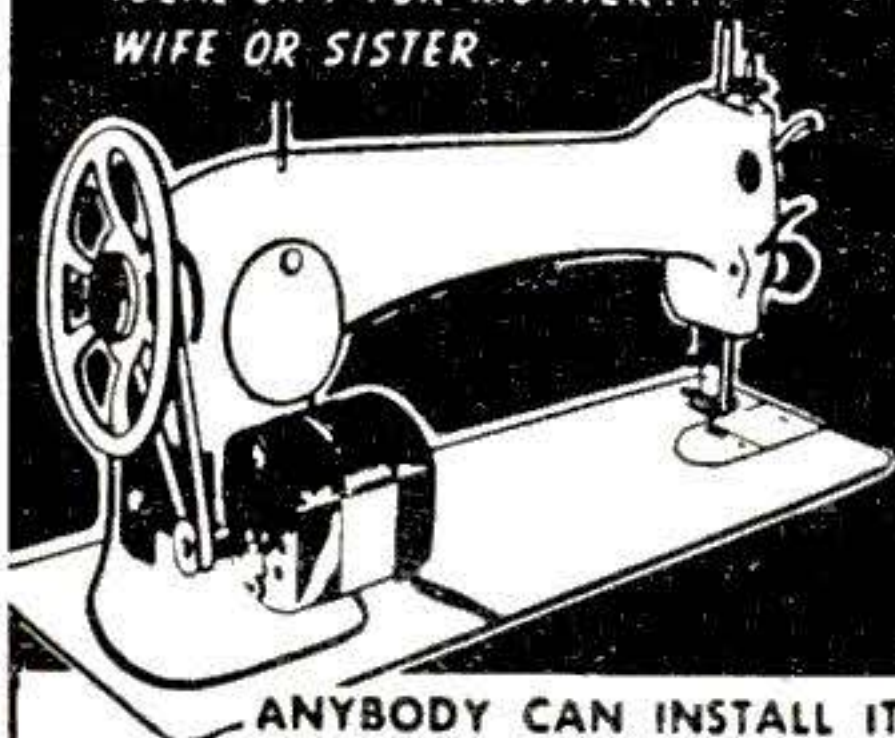
City_____ (____) State_____

*Trade Mark Reg. U. S. Pat. Off.

683M

ELECTRIFY YOUR SEWING MACHINE

IDEAL GIFT FOR MOTHER
WIFE OR SISTER



SEWING MACHINE MOTOR KIT...

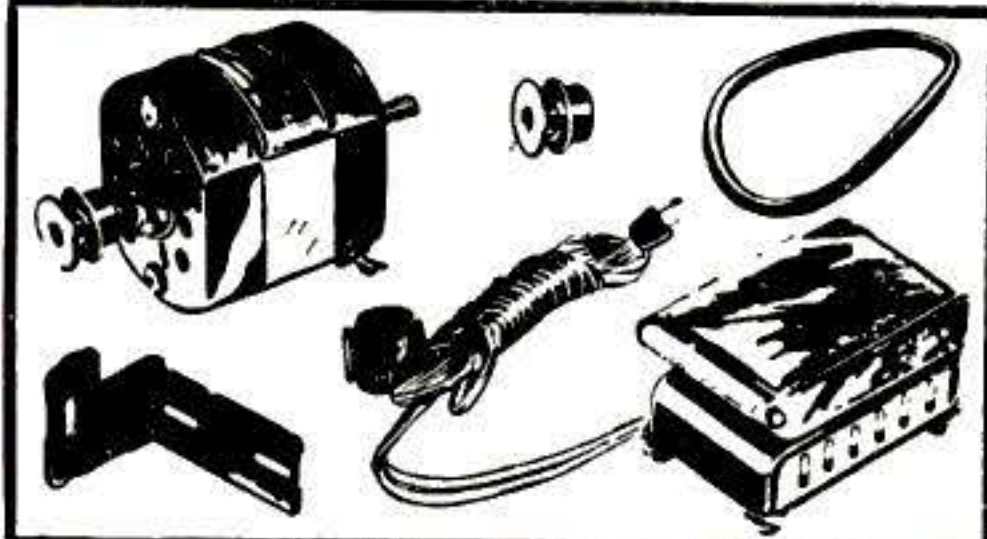
90 DAY
GUARANTEE

\$16⁷⁵
COMPLETE

ANYBODY CAN INSTALL IT!

ADJUSTABLE FOR USE WITH
ANY TYPE OF SEWING MACHINE

FULL SATISFACTION OR MONEY BACK

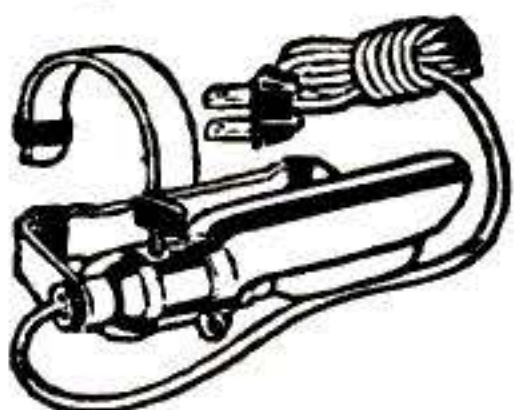


COMPLETE SET CONSISTS OF:

- MOTOR—Fan-Cooled, Universal AC or DC, 60 cycle, 115 volts
- BELT—Long wearing rubber
- PULLEY—Single grooved steel hubbed pulley.
- BRACKET—New and improved.
- FOOT CONTROL—7 step rheostat.
- CORD SET—Extension cord with plug and socket.
- Installation Instruction Sheet.

SPECIAL OFFER!

If you send your order within a twenty day period we include a FREE Sewing Machine Light complete with attachment Socket & Light bulb (value \$2.75) with your kit.



PS-118 BROWNELL DISTRIBUTORS, INC.
308 Canal Street, New York 13, N. Y.

Please rush your kit at \$16.75. The make of my machine is Handwheel turns: ☐ towards me ☐ away from me.

NAME

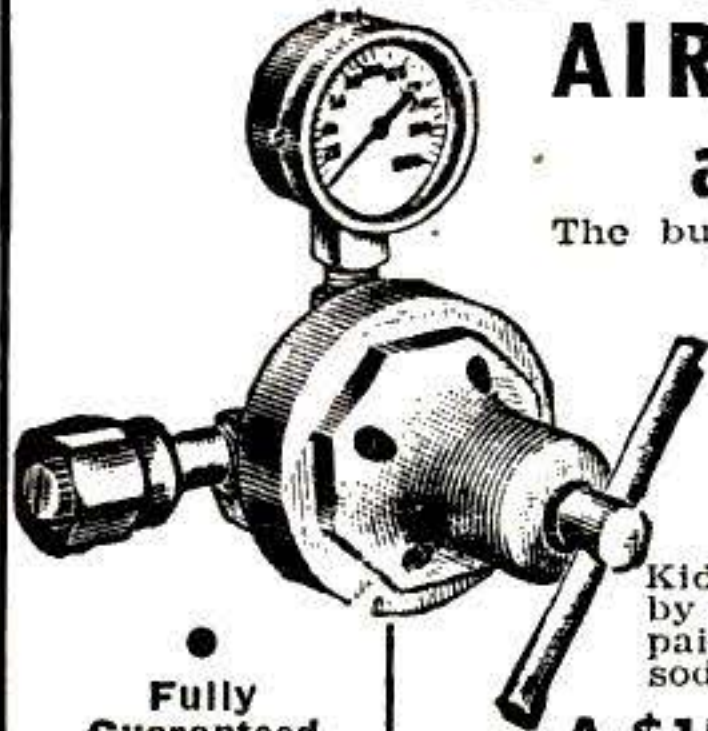
ADDRESS

CITY.....ZONE.....STATE.....

To save postage and C.O.D. charges, I am enclosing \$16.75 ☐, check ☐, money order ☐. Send C.O.D. I'll pay postman \$16.75 plus C.O.D fees

A GREAT SURPLUS BARGAIN

AIR REGULATOR and GAUGE



The buy of a lifetime in a standard make air pressure regulator. Used on liquid carbonic tanks and air pressure tanks of all kinds to regulate the pressure. Fitted with standard 1/2 inch pipe thread. Dial calibrated 0 to 200 lbs. Reduced pressure 0 to 150 lbs. Made by U. S. Gauge, Air Reduction Co., Walter Kiddle—all famous makers. Used by artists for air brush work, sign painters, retouchers, welders, etc., soda fountains and taverns.

Fully
Guaranteed

All Brand
New and in
Perfect
Condition

A \$15.00 VALUE **\$5.95**
(Wt. 4 lbs.)

Price F. O. B. Chicago. Immediate delivery. Sold on money back guarantee. Send check or money order today. Write for free folder.

C & M EQUIPMENT CO.

1831 S. State St., Dept. B-11, Chicago 16, Ill.

PLAY THE ACCORDION IN FEW WEEKS

Thru Startling New "SEE—HEAR—and LEARN" method



Makes learning to play the accordion SURE... FASTER... EASIER... and it's great fun while learning.

Get all the thrilling details. Write to

O. PAGANI & BRO.

289 Bleecker St., New York 14, N. Y.



AMAZING BENCH KNIFE CUTS ANYTHING

My famous handmade Buck knife has a blade that's tempered by a secret process to last a lifetime. The edge is ground to razor sharpness—cuts anything. Handiest tool on your work bench. Ideal for small game. Send check or money order. Satisfaction guaranteed or your money back. \$5 postpaid.

H. H. BUCK & SON

1272 Morena, San Diego, California

TUNGSTEN-CARBIDE SCRIBER

For marking hard or soft steels, plastics, etching, marking and cutting glass. Furnished with two-piece plastic case. Send check or money order today—money-back guarantee.



Tip is 7/16 inches long, set in stainless steel shank.

PRICE

1.50

POST PAID

BENSON Carbide TOOL CO.

23902 Norcrest Drive

Detroit 19, Mich.

\$4.95

REAL ENGINE VALUE



A miniature gas engine that really operates. Thousands of Buzz "B" gasoline engines have been sold at twice the price. Now is your chance to buy a real 1/6th H.P. gas engine for only \$4.95. Turns up over 8,000 rpm. For Boats, planes, midget cars, etc. Guaranteed and ready to run. Includes Champion spark plug and tank. Send only \$1.00. engine shipped collect for balance, same day. Write for free catalog or SEND 10c FOR NEW MAMMOTH ILLUSTRATED CATALOG OF THOUSANDS OF HOBBY ITEMS. America's Hobby Center, Inc., Dept. S-118, 156 West 22 St., N. Y. 11

RUPTURE SUFFERERS GET RELIEF



Get comfortable, safe relief with scientific support. Soft, sanitary material gives natural support with real comfort to active wearers. Satisfaction guaranteed. For free literature write:

WEB TRUSS CO.

Dept. S-8, Hagerstown, Md.



NEW SAW EASY HANDLING BIG POWER

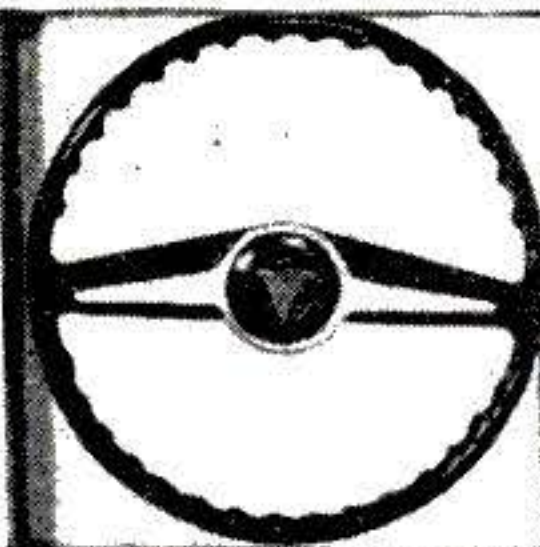
New American Portable Electric Saw saves time, labor and money in production work. Not a hobby tool. One hand operation. Cuts any angle. 8" blade. Write... give occupation.

AMERICAN

FLOOR SURFACING MACHINE COMPANY

532 So. St. Clair St.

Toledo 3, Ohio



Ideal for Xmas

IT'S FUN TO BUILD A JUVENILE CAR

Steering Wheel with Electric Horn Button—Aluminum casting beautifully finished in Red, White & Black. **\$3.87**

Construct-A-Car Wheel Kit—four 10x1.75 semi-pneumatic tired wheels, electric horn button steering wheel, two axles, and one steering shaft. **\$15.50**

Prices F.O.B. Rockville Centre
NELSON-PRICE MANUFACTURING CO.
Box 25 Rockville Centre, N. Y.



THE GIFT I
REALLY WANT!

The World's Greatest
Hand Tool!

- *Most* **POWERFUL**
- *Most* **USEFUL**
- *Most* **COMPLETE**



PORTABLE
VISE



POSITIVELY
WON'T
SLIP



LOCK-ON
HANDLE



CLOSE
QUARTERS



4-POINT
CONTACT
ALL SIZE
NUTS

POSITIVELY
WON'T
SLIP

Every man will be thrilled to receive a gift of the New Model VISE-GRIP! For never before has so much USEFULNESS been packed into a single hand tool! Wonderful for a thousand jobs about the home, shop, factory, farm, and for the sportsman. Does those "impossible" jobs. Adjusts to plier action or LOCKS to the work with Ton-Grip! The *New* VISE-Grip has *added*, important features: INVOLUTE JAW CURVE gives even greater gripping power, all shapes. KNURLED JAW TIPS hold to the very tip. Powerful WIRE CUTTER cuts wire and small bolts. THIN NOSE gets into close quarters. Opens easier from locked position. Made of finest alloy steel. Nickel plated. Guaranteed. Get yours now.

If your dealer doesn't have it, order direct.
Postage paid if price accompanies order.

PETERSEN MFG. CO., Dept. E-11, DeWitt, Nebr.

New
VISE-GRIP
WRENCH

WITH Cutter:
7", \$2.25; 10", \$2.50
WITHOUT Cutter:
7", \$1.85; 10", \$2.25

SCREW DRIVER TIPS

Choose a screw driver just as carefully as you pick a plane, chisel or other fine tool. And don't try to make one screw driver do for all jobs. The best costs so little, it's a real economy to have a full range of sizes and styles . . . long ones for more powerful driving, short ones for close-quarter work and the correct tip width to fit all sizes of screws. Blades tempered entire length. Stanley makes them all the Stanley way.

Coupon brings you two books . . . one FREE, the other the popular workshop textbook, clothbound, illustrated, just \$1.



NO. 2702
for Nos. 5 to 9
Phillips Screws.
Blade secured
by swaged ears.

NO. 25
3" up to 12"
blades. Bolster
construction
locks blade
in wood handle.

THE TOOL BOX OF THE WORLD

STANLEY

Reg. U.S. Pat. Off.

HARDWARE · HAND TOOLS · ELECTRIC TOOLS

Stanley Tools,
2118 Elm St.,
New Britain, Conn.

Please send me by return mail: ☐ FREE booklet, "The Joy of Accomplishment".
☐ 188-page book, "How to Work with Tools and Wood". \$1.00 enclosed.
(In Canada: send order to Stanley Tool Co. of Canada, Ltd., Roxton Pond, Quebec)

NAME _____

ADDRESS _____

CITY _____

STATE _____



NO. 1009
handy for tight
places. Blade 1 1/4"
long. Unbreakable
composition handle.

Make a DRILL PRESS Your Most Versatile Workshop Tool

You can plane woods and plastics, rabbet, tenon, panel, groove, bead, contour, rout, mortise, surface sand, drum sand, cut moldings, shape, dovetail, grind and drill with Barron's time-tested and proved precision workshop tools. They save time, money, broaden your workshop technique. A full line of drill press spindle adapters and 1/2" Dovetail cutter also available. All tools sold on 10 day money back guarantee.



**ROTARY WOOD
PLANER**

3" dia. safety planer fits any drill press. Over 100,000 now in use.

\$7.50 Complete



**2 1/2 x 3" DRUM
SANDER**

A "must" for sanding contours and straight edges. Also available in 1" dia. at \$2.10

\$3.95 With 5 Sleeves



**ROTARY SURFACE
SANDER**

4" dia. aluminum housing and heavy rubber pad. A perfect finishing sander.

\$5.95 With 20 Discs



**AUXILIARY
DRILL PRESS TABLE**

Fits any drill press. Has 234 sq. inch working surface for holding work pieces flat and true. Equipped with adjustable steel fence.

\$9.85 F.O.B. Detroit



**ALL-METAL
SHAPER FENCE**

Ideal for shaping and molding operations, other uses. All metal, nothing to warp. A real buy at

\$7.95 F.O.B. Detroit



**ROUTER & ROUND END
MORTISING BITS**

New type hi-speed steel spiral flute bits. Available in individual sizes or sets of 6 attractively packaged from 1/8" to 1/2" at \$9.50

**WRITE
FOR
FREE
WORKSHOP
GUIDE**



**SAFETY SHAPER &
MOLDING CUTTER**

New, patented design eliminates set screw. More versatile than any other similar design on market. **\$9.00** with 3 Sets Standard Blades

See Your Dealer . . . Or Write Direct

BARRON TOOL CO., INC.

270 Architects Bldg., Detroit 1, Mich.

BARRON PRECISION WORK SHOP TOOLS

The Best
BUFFER • POLISHER • SANDER
we've
ever seen

- NO BULGE AT THE CENTER!
- 6" DIAMETER FLAT SURFACE!
- FITS ANY 1/4" ELECTRIC DRILL!

UNSURPASSED FOR
• SANDING and POLISHING FURNITURE, FLOORS,
WOODWORK, LINOLEUM • AUTOMOBILE WAXING

COMPLETE WITH:
✓ 3 SANDING DISKS
✓ 1 DISC BACKING PAD
✓ GENUINE LAMB'S WOOL BUFFER

5 DAY MONEY-BACK GUARANTEE AGAINST MECHANICAL DEFECTS

EASTERN HARDWARE & SUPPLY CO., INC.
599 TENTH AV., DEPT. 4 NEW YORK 18, N.Y.

\$2.45
PLUS
POSTAGE

TERRIFIC BARGAINS



ELECTRIC MOTOR 1/2 H. P. 27 V. D.C. R.P.M. 4000 #750 For intermittent or continuous duty 5/8" SHAFT VARIABLE SPEED MOTOR. Can readily be adapted to 110 V. A.C. or R.E.A. line by simple method of rearranging armature brush leads. **UNUSED \$5.50** instructions included.

LUBE PUMP. New Precision Gear Impeller pump. Pumps liquid up to 3 G.P.M. Pressure up to 200 lbs. per Sq. in. For high vacuum, air pressure, liquids operating units, etc. Size 3 1/2" x 8 1/2" St'd 1/2" Shaft. Complete **\$3.50** instructions incl. Ea.

BRAND NEW WONDERFUL ROTATOR MOTOR For rotating Ham FM Antennas, Turntables, Telescopes, etc. Operates directly on 110 V. A.C. 60 cycles (requires only 12 MFD condenser) 3/4 R.P.M. For operating Ventilating Louvers such as used with Attic Fans, Furnace Dampers or check drafts. Complete in-
\$3.95 instructions incl. Ea.



NEW CUNO OIL FILTER, aircraft type keeps oil clean without cartridge replacement. For AUTOS, TRUCKS and TRACTORS. Install at home in a few minutes. **STOP CHANGING MOTOR OIL. \$4.95** Instructions incl.

SELSYN CONTROL TRANSFORMER Model #2J1G1, 57.5 V. 400 cycles. Can be used on 115 V/60 cycle A.C. Instructions Incl. New Ea. **\$1.00**

SPEED REDUCERS. G.E. 10 to 1 ratio, or 5 to 1 Shaft Driven 1/2" spline Shaft. 3 mounting holes 5/16". Unused Ea. **\$4.50**

DYNAMOTORS. BRAND NEW. Check list and order now. Input 27 V. D.C. 485 KVA Output 115 V. A.C. Wt. 16 lbs. Ea. **\$4.50**
DYN. new model #23350 Input 27 V. D.C. output 285 V. D.C. Ea. **\$1.35**
DYN. new G.E. Model PE 73-CM Input 28 V. A19, Output 1000 V. D.C. 350 MA wt. 38 lbs. Ea. **\$4.95**
DYN. new Model #DY-22/ARC Input 28 V. D.C. Output 210 V. D.C. Duty cont. Ea. **\$1.35**

Send check or money order. No c.o.d.'s prices f.o.b. K.C.

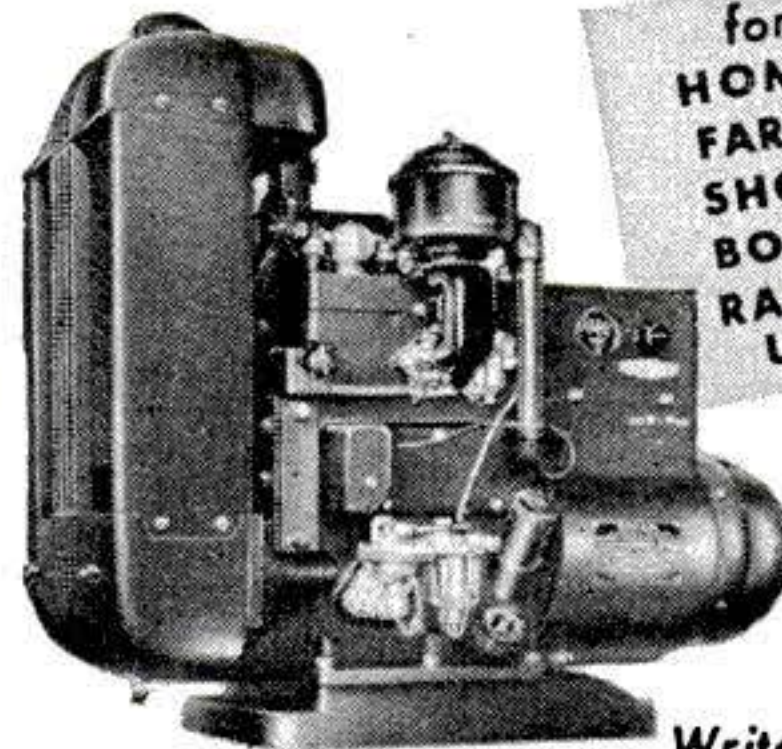
GENERAL SALVAGE COMPANY

Dept. 25

2920 E. 27th St.

Kansas City, Mo.

ELECTRICITY *Anywhere*



for
**HOMES
FARMS
SHOPS
BOATS
RADIO
USE**

● Onan gasoline-engine-driven Electric Plants supply reliable, economical electric service for any use. Portable, stationary or stand-by models. Water or air-cooled, compact and rugged.

A.C.: 350 to 35,000 watts in all standard voltages and frequencies. D.C.: 600 to 15,000 watts, 115 and 230 volts. **BATTERY CHARGERS:** 500 to 3,500 watts; 6, 12, 24, 32 volts.

Write for folder

D. W. ONAN & SONS INC.

2789 Royalston Ave., Minneapolis 5, Minn.



OTTAWA TRACTOR SAW



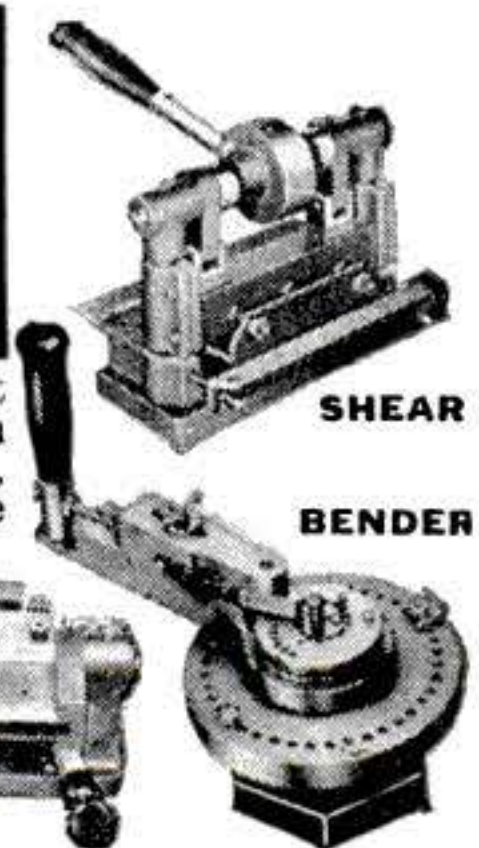
350 Cuts Per Minute--cuts them down, saws them up, one man operates. Thousands in use, stiff heavy blade, built to last, safety clutch control, uses power take-off any tractor. Low price. OTTAWA MFG. CO., 2-801 Forest Avenue, OTTAWA, KANSAS

DIE-LESS DUPLICATING

Many small parts can be formed without dies, to duplicated accuracy of .001" with DI-ACRO Precision Machines. — Benders, Brakes, Shears. Save die expense and time delay. Ideal for experimental and research work, making samples, models, etc. as well as regular production runs. Write for descriptive literature.

O'NEIL-IRWIN MFG. COMPANY

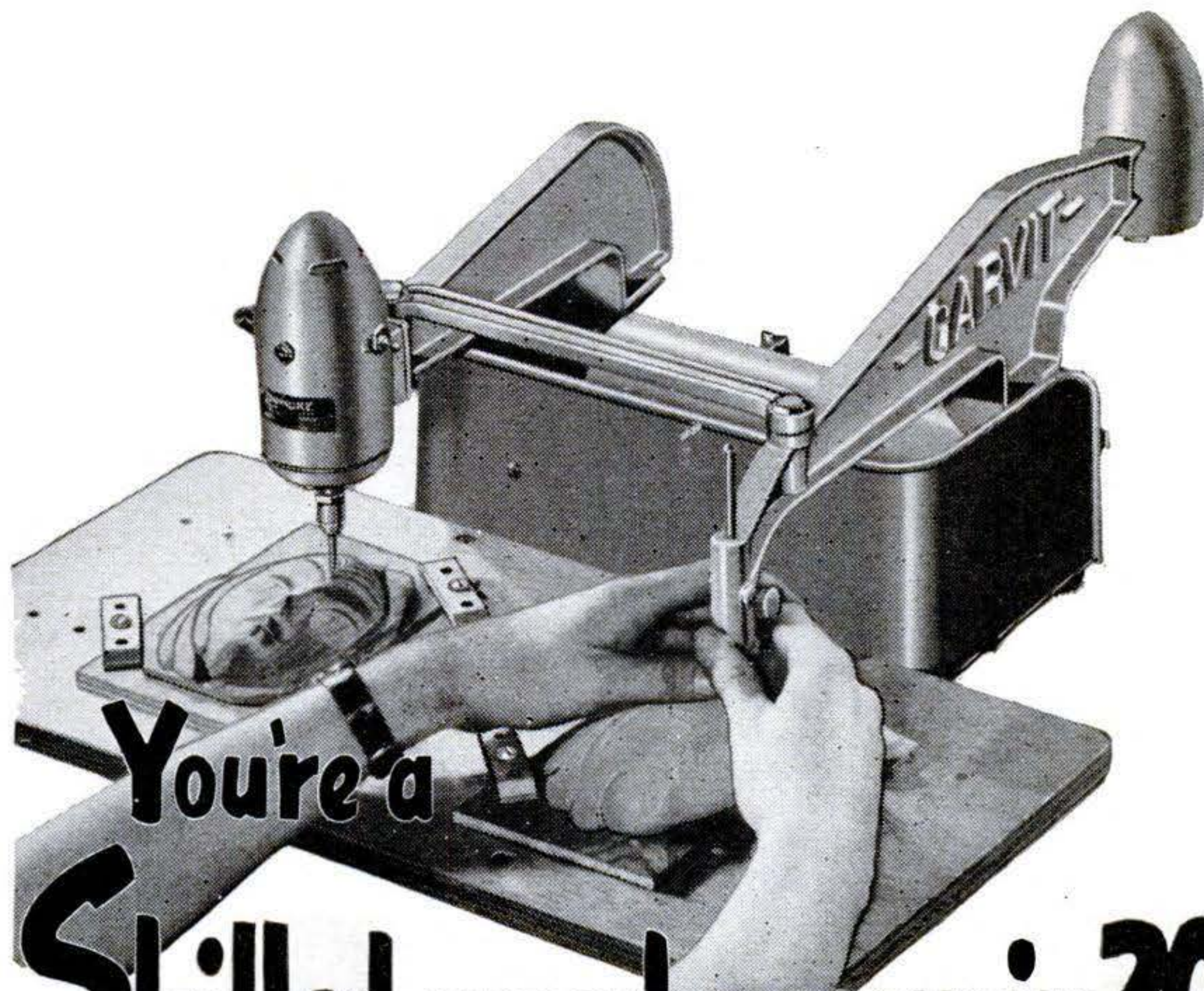
342 8th Ave., Lake City, Minn.



SHEAR

BENDER

BRAKE



You're a Skilled wood carver in 20 minutes



New!

Attachment makes
your Carvit a Flexi-
ble-Shaft Machine.

Woodcarving is great fun with the Carvit, a delightful hobby complete in one tool! It's simple, too. Even a child can make fine carvings with a Carvit. And experienced craftsmen say it's just the thing to give their wood-working projects a professional touch with carved ornamentation. With a Carvit, you make beautiful copies

of low-cost objects. You can find dozens of models in any dime store or gift shop. Reproduce them in mahogany, walnut, and other fine woods on your Carvit. Your carvings are many times more beautiful and valuable than the originals. And it's so easy! Your friends are amazed at the perfection of your first carving. Try it and see!

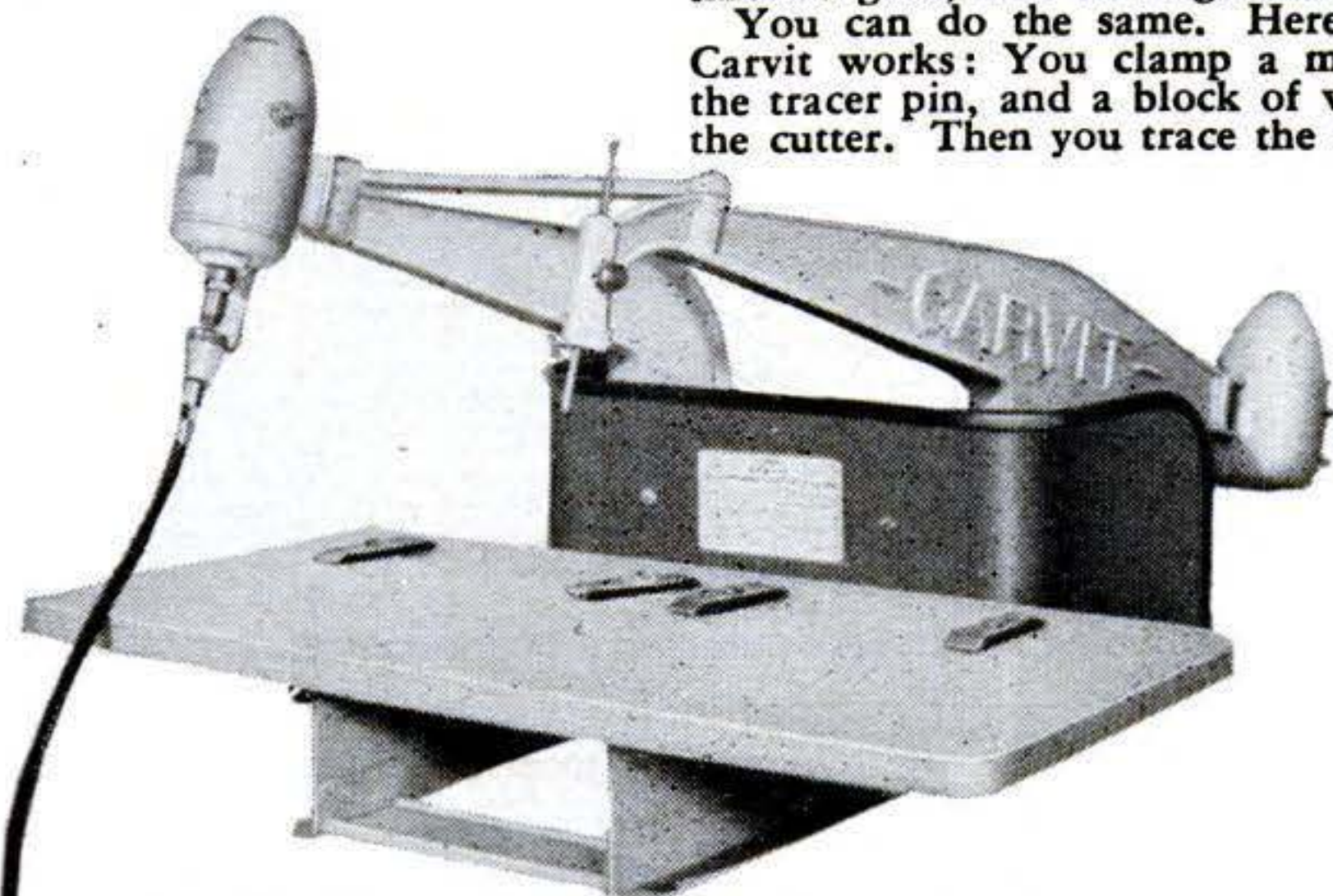
No skill or training needed

Hundreds of Carvit owners find hours of happiness and profit in wood carving. They carve useful ornaments for the home, distinctive gifts, fine carvings that sell.

You can do the same. Here's how the Carvit works: You clamp a model below the tracer pin, and a block of wood below the cutter. Then you trace the model. The

Carvit makes an exact duplicate for you. With an index attachment, you can carve statuettes and busts the same way. Simple, isn't it?

The Carvit is an ideal gift for every hobby fan — and for anyone with an artistic flair. See the Carvit at your local hardware store today — or mail the coupon below.



Flexible-Shaft Chucks Right into Carvit Motor

— converting it to a tool of 1001 uses for work in wood, metal and plastic: sanding, filing, grinding, cleaning, polishing, routing, etc. \$6.25.

**Tear out this coupon
and mail it today!**

The Dumore Company, Dept. 52L, Racine, Wis.

- ☐ Please send complete information on the Carvit.
- ☐ Please send one Carvit. \$48.50 enclosed.
- ☐ Please send one Carvit with Index Attachment. \$58.25 enclosed.
- ☐ Please send Flexible-Shaft attachment for Carvit. \$6.25 enclosed. Shipping charges C.O.D.

H-21

Name.....

Address.....

City.....(.....) State.....

Satisfaction guaranteed or your money back
in 10 days!

Win
an Income
for Life!



You have three months to work — so get in line early and be a winner.

City.....Zone....State.....
Dept. PS

\$12⁹⁵

264 W. 40th St., New York 18, N. Y.

QUANTITY LIMITED
ORDER TODAY. A real \$12 value for
 only \$3.95 Postpaid. Mail check or
 money order now or sent C.O.D. plus post-
 age. Money back in 10 days if not satisfied.
Special 10 % discount on orders for 3 or more.
DIO HOSPITAL 442 East 86th St., Dept. B20
 NEW YORK 28, N. Y.

**DRAFTING
TEMPLATES**

ARCHITECTURAL
 ELECTRICAL
 MECHANICAL
 PLUMBING
 PNEUMATIC
 RADIANT HEATING
 ROOFING
 SANITARY
 STRUCTURAL
 THERMAL INSULATION
 VENTILATION

RAY OSTER

128 PAGES
 11 X 8 1/2 INCHES
 1994

RAY OSTER

128 PAGES
 11 X 8 1/2 INCHES
 1994

Box 592, Glendale, Calif.

AN IDEAL AND PRACTICAL GIFT FOR ANY MAN!

*The New Improved
All-Purpose*

DYNAMIC Super Charged ARC WELDER

Industrial Transformer Type

IT WELDS • IT BRAZES • IT SOLDERS

IDEAL FOR AUTO—HOME APPLIANCE AND FARM REPAIRS. This portable, industrial transformer type welder easily carried right to the job can be operated from any convenient properly wired 110 Volt 60 Cycle Line. Can also be supplied for 220 volt 60 cycle operation and other voltages and cycles at slight additional cost.

EASY-TO-OPERATE. If inexperienced you can easily learn to do a variety of high grade welding jobs by following the practical, simplified welding and operating instructions furnished. Once you see the DYNAMIC WELDER in operation you won't want to be without it. Its simplicity will amaze you. In a year the DYNAMIC only costs you about 7c a day. COMES COMPLETE READY TO OPERATE WITH HELMET, RODS, CABLES, HOLDER, OPERATING AND WELDING INSTRUCTIONS, ETC.

SAVES YOU VALUABLE TIME AND MONEY!

DESIGNED TO DO HIGH GRADE WELDING inexpensively—Maintenance Men, Farmers, Mechanics, Machine Shops, Foundries, Auto, General Repair and Job Welding Shops, all using the DYNAMIC find it so indispensable and useful that they can't afford to be without it. **WORKS ON IRON, STEEL, BRASS, BRONZE AND OTHER METALS.** Has 8 metallic and carbon arc heat stages. DOES WORK YOU WOULD THINK ONLY POSSIBLE WITH A LARGER, MORE EXPENSIVE MACHINE.

DYNAMIC WELDER CO., Dept. 118AR, 15 East 23rd St., CHICAGO 16, ILL.

SPECIAL GIFT OFFER! ELECTRIC ARC TORCH ATTACHMENT WORTH \$6.80

THIS TWIN CARBON TORCH illustrated below for use with the DYNAMIC is unsurpassed for brazing, soldering, pre-heating and cutting on iron, steel, brass, bronze and other metals. With it you can greatly increase the profitable uses of your welder. Comes complete with instructions, carbons & cables. Does work of an Oxy-Acetylene Torch.

MAIL COUPON FOR FREE DETAILS

10-DAY TRIAL OFFER

**DYNAMIC WELDER CO., Dept. 118AR
15 EAST 23rd STREET, CHICAGO 16, ILL.**

Send me FREE details of your ELECTRIC Arc Torch Gift Offer and Dynamic Welder 10-Day Trial Offer.

NAME _____

ADDRESS _____

CITY _____ Zone _____ STATE _____

ONLY

\$2850 COMPLETE

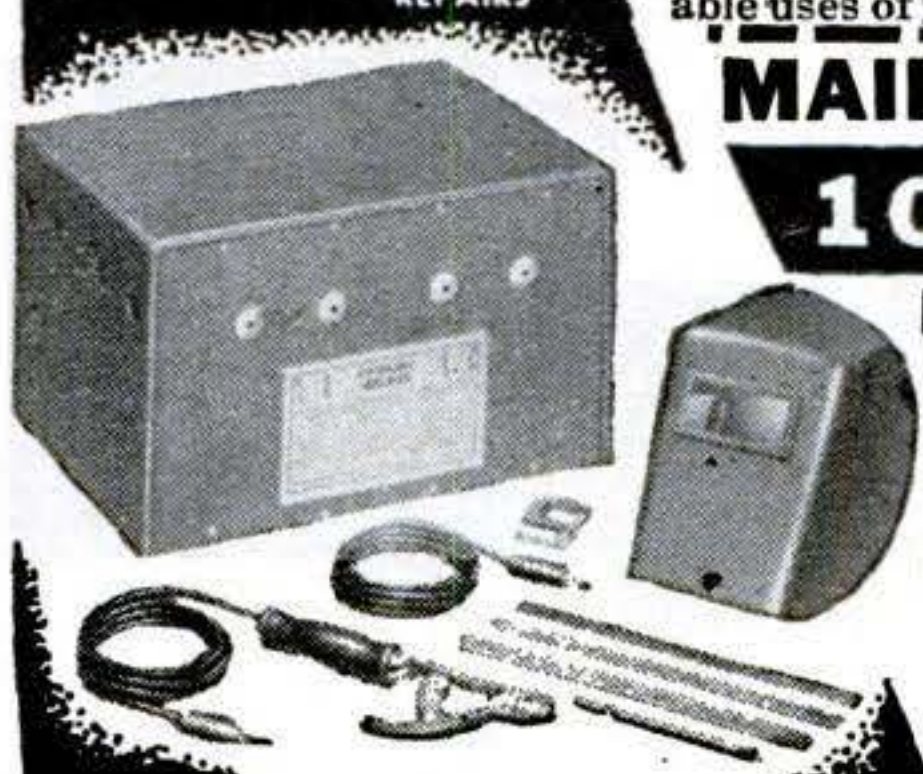
Do Your Own Welding

Just a few repair jobs will pay for this machine. A practical and profitable machine tool for any workshop... Make money doing repair work for others.

Write Today for Particulars

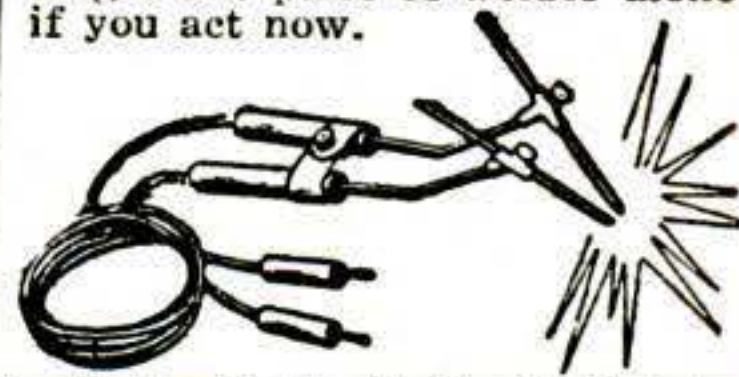
GET DETAILS on our 10 day Trial Offer.

Member Chicago Association of Commerce.



Yours at No Extra Cost!

For a limited time only we are giving away a Twin Carbon Electric Arc Torch worth \$6.80 with every DYNAMIC WELDER. This valuable premium is yours at the single low price of welder alone if you act now.



Pneumatic Air Tools

SAVE \$64.00 AND UP

Ideal fender and bumping hammers, and for riveting brake lining, concrete breaking and many other uses. Like new. At these unheard of low prices it pays to order a good supply.



CHICAGO PNEUMATIC RIVETER & CHIPPING HAMMER

CP4X Pistol grip handle, with air control. Takes up to 3/16" rivet. Weight 6 lbs. List price \$73.00. **\$8.95** Special price

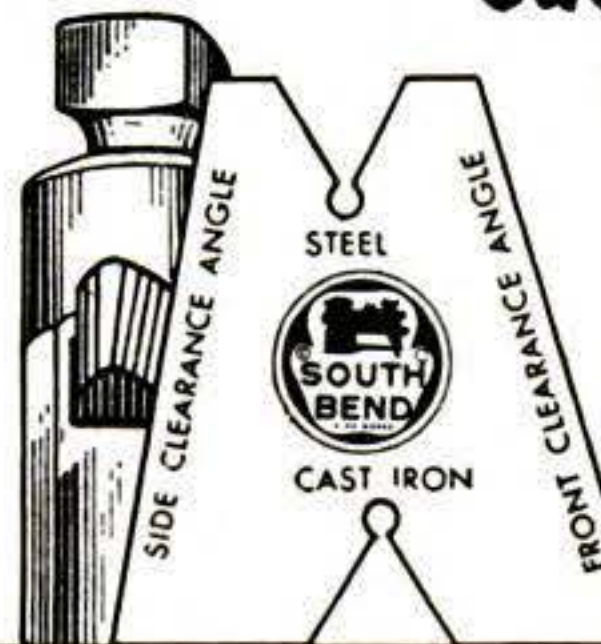
Size CP3—Takes 5/32" Rivet \$7.95
PRS-A5-Squeezer \$17.95

PRICES F.O.B. CHICAGO. Immediate delivery. SOLD ON MONEY BACK GUARANTEE. Send check or money order.

Write for free folder on Air Compressors and Equipment

C & M EQUIPMENT COMPANY 1831 S. State St., Dept. B-11, Chicago 16, Ill.

Cutter Bit Grinding Gauge

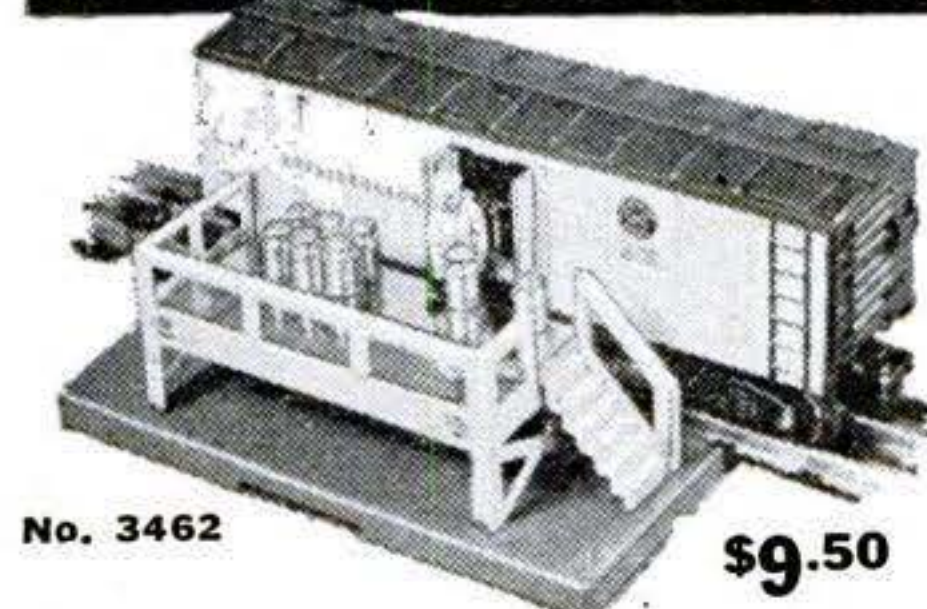


This gauge eliminates guesswork when grinding cutter bits. Every necessary angle, including rake can be checked. Made of stainless steel. Size 1-7/8" x 2" x 1/16".

PRICE **50¢** POSTPAID

SOUTH BEND LATHE WORKS
456A E. Madison St.
South Bend 22, Indiana

IF IT'S MADE BY LIONEL, YOU CAN GET IT AT MADISON HARDWARE



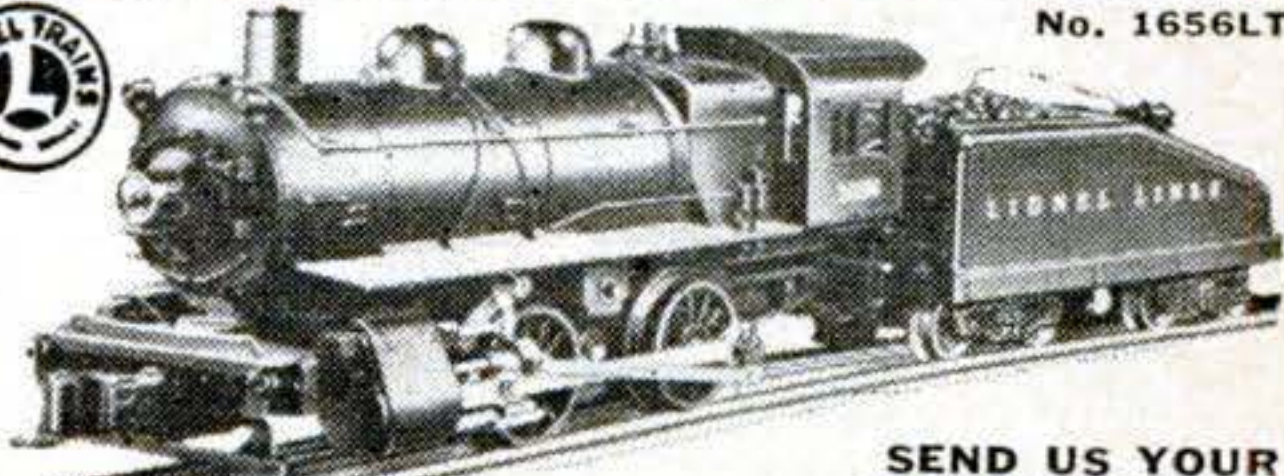
No. 3462

\$9.50

Brand New!

LIONEL STEAM-TYPE SWITCHER LOCO & TENDER! \$25.00

Real railroad-type knuckle couplers at front and rear make this handsome loco the workhorse of your layout! Goes forward or backward by remote control. Tender has thermostatically controlled bell; rear back-up light. Powerful headlight, realistic valve gear, jewelled running lights, stainless steel handrails. For all gauges.



No. 1656LT

SEND US YOUR LIONEL REPAIRS

We pay postage on cash orders. C.O.D.'s accepted.

MADISON HARDWARE CO., 103 E. 23rd St., New York 10
Please ship Quantity..... Switcher Loco & Tender @ \$25.00 each
..... Milk Can with Platform @ \$9.50 each

P.S. ☐ Send me FREE Big Train Folder.

Name.....

Address.....

City..... Zone..... State.....

☐ Cash ☐ M.O. ☐ Check ☐ C.O.D.

MADISON HARDWARE CO., 103 EAST 23rd ST., N. Y. 10, N. Y.

Madison has been World Headquarters for Lionel since 1909. We offer a complete line of Lionel Train Sets, Cars, and Accessories. Write for big Train folder—it's FREE.

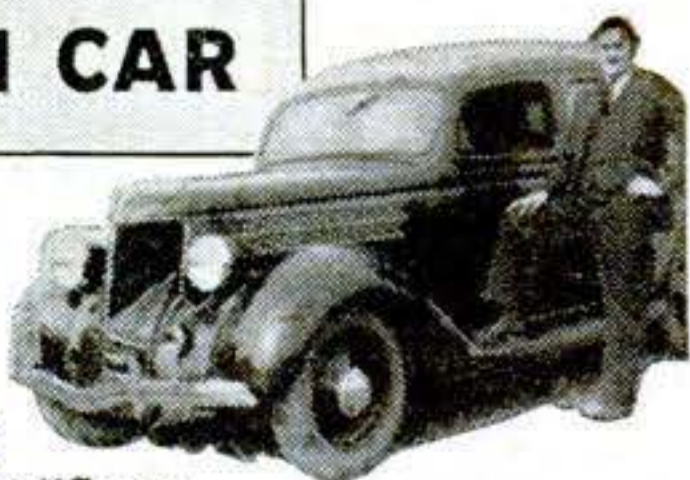
Operating milk car with platform
7 miniature cans load through a roof hatch, and at each touch of the remote control button, door opens and milkman pops out to deliver a milk can to the platform. Car is 9" long, handsomely finished in white enamel. Platform of heavy gauge steel.

WANTED MAN WITH CAR

No Time Like Now to Get In McNessBusiness

It's no trick to make good money when you use your car as a McNess "Store on Wheels." Farmers buy everything they can from McNess Men because McNess Products are tops in quality, represent extra values. Attractive business-getting prizes and premiums; also money-saving deals to customers make selling McNess daily necessities a snap. **We Supply Capital—Start Now!** There's no better work anywhere. Pays well, permanent, need no experience to start, and we supply capital to help you get started quick. You begin making money first day. Write at once for McNess Dealer Book. It's FREE. Tells all — no obligation. (1)

THE McNESS CO., 681 Adams St., Freeport, Ill.



**Use Your
CAR
to Raise
Your
PAY**

**Say You Saw
It In Popular Science**



BUILD HEAVY DUTY MACHINES

SAVE UP TO 90% You can build, using our practical, easy-to-read plans, all kinds of machines, for home, farm or shop—scooters, portable sawmills, metal working machines, concrete machinery of all kinds, printing equipment, woodworking machines, midget autos, dish washers, farm equipment, freezers, tractors.

FREE CATALOG HANDBOOK
183 SETS OF PLANS
VALUABLE INFORMATION

NICHOLS EQUIPMENT COMPANY
Dept. D-1704, PURVIS, MISS.

SHATTERLESS "ALL PURPOSE" STEEL BOTTLE

HAS HUNDREDS OF USES — FOR LIQUIDS, GASES, STORAGE, AIR PRESSURE, ETC.



Formerly used by AAF for oxygen storage. You can use it now as an air pressure tank for inflating tires, operating horns, air motors, etc. May also be used as a buoy or float or for water supply storage on boats, trailers and trucks. Ideal as shipping container for gases, chemicals, etc. Bottle is non-shatterable with working pressure up to 500 lbs. psi., and weighs only 5 lbs. when empty. Internal volume 500 cu. in. (approx. 9 qts.) Has 3/8 in. pipe thread at each end. Approx. size 24 x 6 in. They won't last long at this low price. Guaranteed brand new. Order now!

**REGULAR
STEEL, EA.**

\$2.95

Just received! Large stainless steel bottles—approx. 12x22 inches. A real bargain while they last. Only **\$5.95**

You pay transit charges. Mail orders promptly filled. Send check or money order. Satisfaction guaranteed.

AERO PARTS SUPPLY, Dept. PS
MUNICIPAL AIRPORT HOUSTON 17, TEXAS

\$1.46 CIGARETTES

PER CARTON
PLUS POSTAGE

**OLD GOLD AND OTHERS
CAMEL, CHESTERFIELD
LUCKY STRIKE, PALL MALL**

MINIMUM,

POSTAGE SCHEDULE

5 CARTONS Up to 300 mi | 600 mi | 1400 mi
Add per carton 2c | 4c | 6c

BILJAC PHOTO SERVICE, Box 887S, Wilmington, Del.

Talk Anywhere Instantly To Anyone



with INTER-TALKIE! JUST PUSH BUTTONS AND TALK TO OR FROM 7 DIFFERENT PLACES! Not a phone—loud room volume—NO ELECTRIC "PLUG-INS" OR TUBES NEEDED! Sit or hang it! SIMPLE AND QUICK TO HOOK UP. For HOMES, OFFICES, STORES, FARMS, etc. Guaranteed satisfaction. Write for FREE details today!

**ONLY
\$9.97
each**

MIDWAY SALES CO., PS-11, Kearney, Nebr.

SENSATIONAL REDUCTION!

Famous **CASCO** 23-Piece

ELECTR-O-TOOL KIT

**AT LOWEST
PRICE IN
YEARS!**

\$23.45 VALUE

**CLEANS • POLISHES • CUTS • GRINDS
BUFFS • DRILLS • BRUSHES • CARVES
ENGRAVES • ETCHES • ROUTES • SHARPENS
SANDS • SAWS • MANY OTHERS!**

SPECIAL!

**50-Piece DeLuxe
ELECTR-O-TOOL
KIT**

with steel chest
and lift-out tray,
now at \$13.00
saving! Formerly
\$32.95, Our Price
only \$19.95

• Nationally advertised Casco Power Tool at startlingly low price. Complete power workshop in convenient portable kit. Work easier and faster on wood, glass, metal, plastics, etc. Hold the tool like a pencil for one hand operation. So easy, even a youngster can do it. Dynamically balanced to eliminate vibration. Safe! Tool operates only after thumb releases safety collar. 20,000 R. P. M. fractional h.p. motor in shock-proof Tenite housing. Air cooled. Oil-less bearing. Operates on 110-120 V. AC-DC. If bought in separate units, Electr-O-Tool Kit would cost \$23.45. Now you get it for price of tool alone—only \$14.95. Guaranteed by factory for 90 days. Money Back if not 100% satisfied.

SEND NO MONEY Pay postman on delivery plus postage and C.O.D. fee. We prepay charges if payment sent with order. **USE COUPON—TODAY!**

SANGERS, 325 N. Wells, Dept. PS, Chicago 10, Ill.

**ONLY
\$14.95
POSTPAID**

THE POWER WORKSHOP OF 10,000 USES!

Kit Includes:

ELECTR-O-TOOL

PLUS

Rubber Polishing Wheel
3 Mandrels 2 Collets
Felt Wheel Wrench
3 Bristle Brushes
2 Abrasive Discs
4 Emery Wheels
1/8" Ball Cutter
1/8" Speed Drill
Dressing Stick

Each accessory makes a different, efficient tool in a jiffy!

All in Handy Fitted Chest!

Valuable
Given! Project Booklet:
**"THINGS TO MAKE AND
HOW TO MAKE THEM."**
Included at no extra
charge with each Kit!

MAIL THIS COUPON NOW!

SANGERS 325 N. Wells St., Chicago 10, Ill. Dept. PS

Please send me Casco Electr-O-Tool Kits as marked:

☐ 23-Piece Kit, complete, for only \$14.95.

☐ 50-Piece DeLuxe Kit, complete, for only \$19.95.

Send C.O.D. I will pay postman \$..... plus postal charges. I enclose \$..... in full payment. Send postpaid. Sold On 5 Day Money Back Guarantee!

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Illinois residents, add 2% for State Tax.

THROWING KNIFE
Properly shaped and balanced for throwing. Hunt small game; target practice. Thrilling stunt. Ruggedly built. Penetrating point. Tool steel. Hard hitting. Easy to throw. About 7-in. **\$1.98**

Midget Electric Motor
DRIVES BOATS, CARS, PLANES & MODELS
Sensational midget, powerful, practical motor that really drives your models. Speedy, powerful. Do not compare with cheap motor kits. Fun, practical, useful. Runs on flashlight cells. Same motors used in models selling for \$5 to \$10. Complete—cells, switch, motor parts, grooved pulley, fly-wheel, crankshaft. Easy to assemble; all finished parts. Powerful. Up to 5,000 r.p.m. 2-in. high; 1x1-in. Kit. **\$1.19**

POWERFUL TELESCOPE
See Craters On Moon!
See objects 250 diameters larger! Imagine moon 250 times wider and bigger. Thousands of times larger! See rings of Saturn, moons of Jupiter, double stars. Amazing magnification of distant objects. Easy to build in one evening. Complete lens kit. Finished lenses only. Tripod not included. Lens Kit. **\$2.98**

250 Power Lens Kit
Finished 3-in. diameter 75-in. focal length ground & polished objective lens, plus all eye-pieces, lenses needed to give magnification of 50, 100, 150, 200 & 250 power with illustrated directions for mounting.

Hula Girl Zipper Bill Fold
9 Windows In Full Color
Embossed breath-taking colors. Zipper. Genuine leather. **\$2.29**

BB & Pea Shooting Gun
Catapult action. Harmless fun. Brightly polished all-metal gun. Full size. Attractive automatic style. **49c**

500 Shot Repeater AIR PISTOL
SET
500 SHOT. Safe, accurate target pistol. Harmless. Famous Daisy quality. Shoots .118 shot, 10-in. blue steel gun. Single sliding motion cocks gun. With tube of 500 shot target cards & metal spinner target. **\$2.95**

3 IN 1 AIR PISTOL
\$3.49
3 for \$9.50
Order BB's for Your Air Guns
SPORTSMAN JR.—sensational low priced air pistol. Ruggedly built, wonderful looking, full size target gun shoots standard BB's, pellets or steel darts. Fast, single-action compression chamber. Single shot; silent shooting. Use indoors or outdoors. Modeled after famous target pistol. Economical to operate. Die cast metal non-slip moulded grip; machined steel chamber and barrel. 8-in. long; 4 1/2-in. deep; weighs 15 oz. Order plenty of ammunition. ONLY **\$3.49**
BB's, 3 pks. 25c; 177 pellets, 500 for \$1.50; Steel darts, 35c pkgs.; Molder, 50c.

Watch It Change Color! LIVE CHAMELEON
50c
Get one of these most wonderful creatures. Watch it change color. Study its habits. Wear one on the lapel of your coat as a curiosity. Shoots out its tongue to catch flies while in the air! Goes for months without food. Almost 4-in. long. Live 50c delivery guaranteed. Allow 14 days for delivery. Prices...
Chameleon Food, Package...20c
Lapel Pin & Chain...15c

HAVE FUN FENCING Fencing Set
\$2.50
Learn to fence! Fight with swords (foils). Teaches you the art of self defense same as in boxing. Set consists of 2 steel foils (swords) 3 feet in length, with an aluminum guard and complete instructions on how to fence. Teaches you to think and act quickly. Plenty of fun with this sport—by the champ swordsmen! Foils equipped with hand guard and rubber tip. Sensationally low priced. Set of 2 Foils and Instructions. Price...**\$2.50**

Remarkably Low-Priced Imported Chronograph Style Stop Watch
Time Races & Games—Tells Speeds—Plus Fine Swiss Wrist Watch
You'll thrill to many ways this wonderful wrist watch will serve you. Has two button stop-and-start movement. A flick of the button and it starts; another flick and it's stopped. Time races, games, experiments, lab, shop or kitchen work. Chronograph dial converts to speed so you can measure how fast races are run. Telemeter dial measures distance from object, sound or light by observing how long sound takes to reach you. Tachometer measures speed of any object. Swiss made, chronograph style. Watch alone when button is pushed, starts when second button is pushed. Accurate timekeeper. Beautiful chrome steel case. Leather strap. Add \$1.10 tax. Swiss Chronograph Style Watch. **\$10.95**
Add Sales Taxes. Sorry—No C.O.D.'s. at These Cash Prices

SEND ORDERS FOR ARTICLES ON THIS PAGE TO Johnson Smith Co., Dept. C-24, Detroit 7, Michigan

Send TODAY for YOUR COPY of this **MAMMOTH NEW CATALOG** of **7000 NOVELTIES**
500 Pages! **ROTOGRAVURE SECTION** **3500 Illustrations!**
6 COLOR COVER

BETTER BIGGER
WORLD'S BIGGEST CATALOG
OF AMAZING GIFTS, NOVELTIES, GADGETS, FUN MAKERS
BEAUTIFUL MAMMOTH!
6 COLOR
500 Pages
7000 Novelties
3500 Illustrations
Novelties & Gadgets From All Over the World
Rush 10c
One Inch Thick

- PARTIAL CONTENTS**
KITS
WIGS
PIPPES
LOCKS
BANKS
BOATS
STAMPS
PUZZLES
HOBBIES
GADGETS
TURTLES
JEWELRY
VENDERS
WATERGUNS
DISGUISES
FIREWORKS
ALLIGATORS
TELESCOPES
TIMESAVERS
FUNMAKERS
EXERCISERS
AIR PISTOLS
SLIDE RULES
BAROMETERS
CHAPELIONS
NOVEL RINGS
MICROSCOPES
COIN CHECKS
PRESS CARDS
ELECTRIC EYE
MAGIC TRICKS
ARCHERY SETS
MONEY SAVERS
TRANSMITTERS
INDOOR GAMES
FIELD GLASSES
CURIOUS SEEDS
SKELETON KEYS
MAKE UP GOODS
RUBBER STAMPS
JIG SAW PUZZLES
BANKS & VAULTS
SPORTING GOODS
NOVELTY CHECKS
SYMBOL JEWELRY
HUNTING KNIVES
CIGARETTE CASES
FORTUNE TELLERS
ELECTRO-PLATERS
FENCING SUPPLIES
EXPLODING JOKES
FISHING SUPPLIES
LUCKY NOVELTIES
GAMES OF CHANCE
INDIAN NOVELTIES
BOOKS FOR LOVERS
HULA HULA SKIRTS
OCCULT NOVELTIES
PROJECTORS & FILM
SWITCHES
RADIO & SUPPLIES
OVER 500-10c BOOKS
LIVE ANIMALS & PETS
Many, Many Other Things

Nothing else quite like it! More interesting than carnival, circus, world's fair and science exhibit rolled into one. 500 pages packed full of pictures, descriptions of odd items from all over world. Some not sold in stores; odd items; hard-to-get things like monkeys. Covers hobbies, useful gadgets, funmakers, time-savers and ALL novelties. **WORLD'S GREATEST COLLECTION.** Weird things like shrunken skulls, guns, rifles, etc. Get some of the funmakers and fool your friends. See the amazing hobby and scientific novelties, the money-makers and money-savers. You'll be amazed and pleased.

Colliers, Tide, Coronet, New Yorker Magazines Write About It
They call it **MOST UNUSUAL CATALOG IN WORLD.** 25,000,000 orders in 35 years—our record. It's a catalog, but it is also the most wonderful book you've ever seen. Most articles are 25c or less! We charge small amount because of tremendous demand. Every copy costs us nearly 75c! No obligation—we want you to get a copy.

Beautiful 6-Color Cover; Roto Picture Section; 7000 Novelties
Wonderful book to have. Send for your copy today—don't wait until this limited edition is gone. Send money any way you wish; coin or stamps accepted.

De Luxe Hard Bound Library Edition Available
Many people like permanent library copy in beautiful hard-bound Library binding. Costs only 25c and it lasts for years.

RUSH ME MY NEW CATALOG!

☐ 10c Paper Cover Edition ☐ De Luxe Hard Bound Library Edition 25c
Name _____
Address _____

Johnson Smith & Co., Dept. C-24, Detroit, 7 Mich.

A Terrific Rear - A Brilliant Flash!
\$2.50 BIG BANG
CANON
MAMMOTH
GIVES TERRIFIC REAR, BRILLIANT FLASH
Liant flash comes out of barrel—yet safe & harmless. No matches—no gunpowder. 50 shots without reloading. Beautifully designed; extra heavy metal; 9-in. long; 2 1/4-lbs. **CANNON**. 20c; 3 for 50c
Bangsite Ammunition. Pkgs. 20c; 3 for 50c

POCKET SIZE Portable RADIO
Beautiful miniature portable radio with built-in phone. Carry in your pocket.
4x2 1/2x1 1/2-in. NO BATTERIES—NO ELECTRIC CURRENT—NO TUBES. Just connect aerial & ground. Brings in stations 25 miles away and farther. Great pocket set—many uses. Crystal set—no expense to operate. Complete with phone. Postpaid **\$3.99**

BROADCAST THRU YOUR RADIO
Broadcast your voice on programs coming through your radio set—make announcements from any part of house—inject wise cracks, jokes and mystify friends. "Radio Mike" made especially for home use. Attached in a jiffy. Also put on own programs at home, parties, club affairs. Barrels of fun. Easy to operate.
Radio 'Mike' \$1.00

2 Passenger Midget Racer Car Plans
Real Car
Midget road car. Holds 2 passengers. Excellent runabout. Easy to build for about \$25.00. Goes 50 m.p.h.; gets 40 m.p.g. Uses motorcycle or outboard engine, old auto parts. Fun building; fun driving. Complete Large Scale Plans Only **\$2.00**

Eyes Shine in Dark! Skull Ring
Skull & crossbones ring. Sterling silver. Brilliant sparkling red stones make eyes glitter. Size **\$1.98**

ROTARY PRINTING PRESS
High speed, rubber type, PRINTING PRESS. OUT-FIT. ONLY \$2.50 complete! Prints up to 3x4-in. in. Print calling cards, programs, papers, notices, etc. Prints various sizes of type, cuts (illustrations, etc. Rotary press built paper through machine and out. Inks type, all with a single crank! Do color world printing press, 200 pieces of type, 8 type slugs, 2 picture cuts, type tweezers, black ink, ink brush, ink blanket, paper, copy of printer's journal. ONLY **\$2.50**

Ugly BLACKHEADS OUT IN SECONDS
VACUTEX
Remove blackheads! Be good looking! Vacutex removes blackheads in seconds cleanly. Safe, healthy. **\$1.00**
Ready to use...
ANYONE BEAUTIFUL

Sure Win Dice \$1.00 Set
Magic Set of 4: 2 Regular; 2 Fixed.

DICK TRACY 2-WAY WRIST RADIO
WRIST RADIO
Receives regular broadcasts up to about 100 miles and actually transmits your voice over short distances. Wear it like a watch but listen in like any radio. No Batteries—No Electricity—No Tubes—No Expense. (Costs nothing to operate.)
Receives & Transmits; Really Works
Really works. War-developed crystal rectifier. Combination radio receiver and telephonic transmitter with built-in earphone. Complete with aerial and ground connections. If you live within a few miles of a station, a single connection to bed spring, metal of telephone, etc., will bring stations in. Wonderful receiver.
DICK TRACY TWO WAY RADIO. Price... **\$3.98**

LIFE-LIKE REALISTIC RUBBER MASKS
Talk, Smoke, Smile, Drink With Mask On!
SENSATIONALLY REALISTIC! Really disguise yourself, quickly and completely! Modern science has perfected famous RUBBER MASKS which seem to "come to life". Your own expressions and facial movements are reflected in them. Natural looking. Originally made for theatrical work. Soft, pliable latex. Ridiculously human. Covers entire head down to collar. Beautiful Blonde Girl, Monkey, Comic Man, **\$2.95**
Negro, Drunken Man, Devil, Witch, Mad Man, Each... **\$3.99**

MIDGET CAMERA
"Secret" Pictures—Vest Pocket Camera
Midget camera takes secret pictures. Actually conceal in palm of hand! Easy to carry. Easy to use. Black and white or color pictures. Standard Eastman 828 film. Bakelite case and good quality lens and shutter. 8 pictures 1 1/4x1 1/4-in. on each roll. Beautiful enlargements. Only 225-in. **99c**
(Leatherette Eveready Case 50c.) CAMERA SPECIAL
Black & White Film 35c Roll; Color Film \$1.00 Roll

Leather WHIP
Train animal Crack the whip! Power-ful hard plant genuine rawhide 4-ply whip, hand loop. Over 6-ft. long. Each Only **\$1.98**

Gum Vending Bank
DROP IN COIN-OUT COMES GUM! Money saver and money maker! Inserts 25 standard sticks. Insert penny, dime, nickel, etc. Automatic. Colorful plastic, metal trim. Mirror front. Key lock. Size 5-in. high. Get several and make money. COMPLETE **\$1.98**

LUMINOUS PAINT
Glow in dark. Apply to any object, material, article, etc.
White Luminous Paint
Complete with directions. Large Bottle, Only... **\$1.00**

2-WAY WRIST RADIO
Receives regular broadcasts up to about 100 miles and actually transmits your voice over short distances. Wear it like a watch but listen in like any radio. No Batteries—No Electricity—No Tubes—No Expense. (Costs nothing to operate.)
Receives & Transmits; Really Works
Really works. War-developed crystal rectifier. Combination radio receiver and telephonic transmitter with built-in earphone. Complete with aerial and ground connections. If you live within a few miles of a station, a single connection to bed spring, metal of telephone, etc., will bring stations in. Wonderful receiver.
DICK TRACY TWO WAY RADIO. Price... **\$3.98**

LIFE-LIKE REALISTIC RUBBER MASKS
Talk, Smoke, Smile, Drink With Mask On!
SENSATIONALLY REALISTIC! Really disguise yourself, quickly and completely! Modern science has perfected famous RUBBER MASKS which seem to "come to life". Your own expressions and facial movements are reflected in them. Natural looking. Originally made for theatrical work. Soft, pliable latex. Ridiculously human. Covers entire head down to collar. Beautiful Blonde Girl, Monkey, Comic Man, **\$2.95**
Negro, Drunken Man, Devil, Witch, Mad Man, Each... **\$3.99**

MIDGET CAMERA
"Secret" Pictures—Vest Pocket Camera
Midget camera takes secret pictures. Actually conceal in palm of hand! Easy to carry. Easy to use. Black and white or color pictures. Standard Eastman 828 film. Bakelite case and good quality lens and shutter. 8 pictures 1 1/4x1 1/4-in. on each roll. Beautiful enlargements. Only 225-in. **99c**
(Leatherette Eveready Case 50c.) CAMERA SPECIAL
Black & White Film 35c Roll; Color Film \$1.00 Roll

BE YOUR OWN BOSS WITH A **WOODBOS**



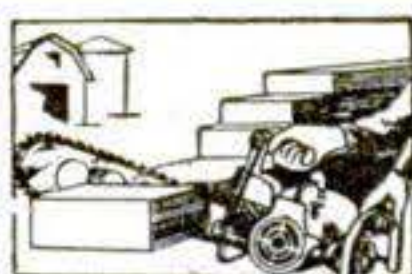
**THIRTY SEVEN
POUNDS OF
CUTTING
MAGIC**



FALLING



BUCKING



SAWING TIMBERS

Hundreds of case histories prove that a man with a Woodboss Saw is always in demand. You and Woodboss can earn \$200 to \$300 a week! Contract logging or sawing for city, county or construction companies; contract falling and bucking, cutting cordwood, to mention a few. Be your own boss with a **WOODBOS**.

Dept. S Write for free booklet and full particulars.

WOODBOS, INC. 2712 N. Mississippi Ave., Portland 12, Ore.

Lifetime Written Guarantee Certificate



ZEISS

Type **BINOCULARS**
8 x 30

\$34.75

7 x 50-\$46.75 7 x 50 Coated-\$56.75

BRAND NEW! Individual focusing. Three to choose from. All purpose 8x30 binocular. 7x50 were the official choice of our great Army, Navy and Marine Corps. All have superb optics, aluminum body. Moisture and dust proofed. Come complete with genuine leather, plush-lined case and straps. Coated price means **entire optical system** is quality coated. These binoculars are peak quality or we wouldn't be able to offer a **LIFETIME WRITTEN GUARANTEE CERTIFICATE!** Add 20% for Federal tax. Cash orders rushed postpaid or send \$2.00 deposit and we will ship C.O.D. for balance plus charges. **UNITED PRODUCTS CO., 7941 S. Halsted, Dept. ARF-616, Chicago 20**

MICRO-GROOVE L-P PHONOGRAPH

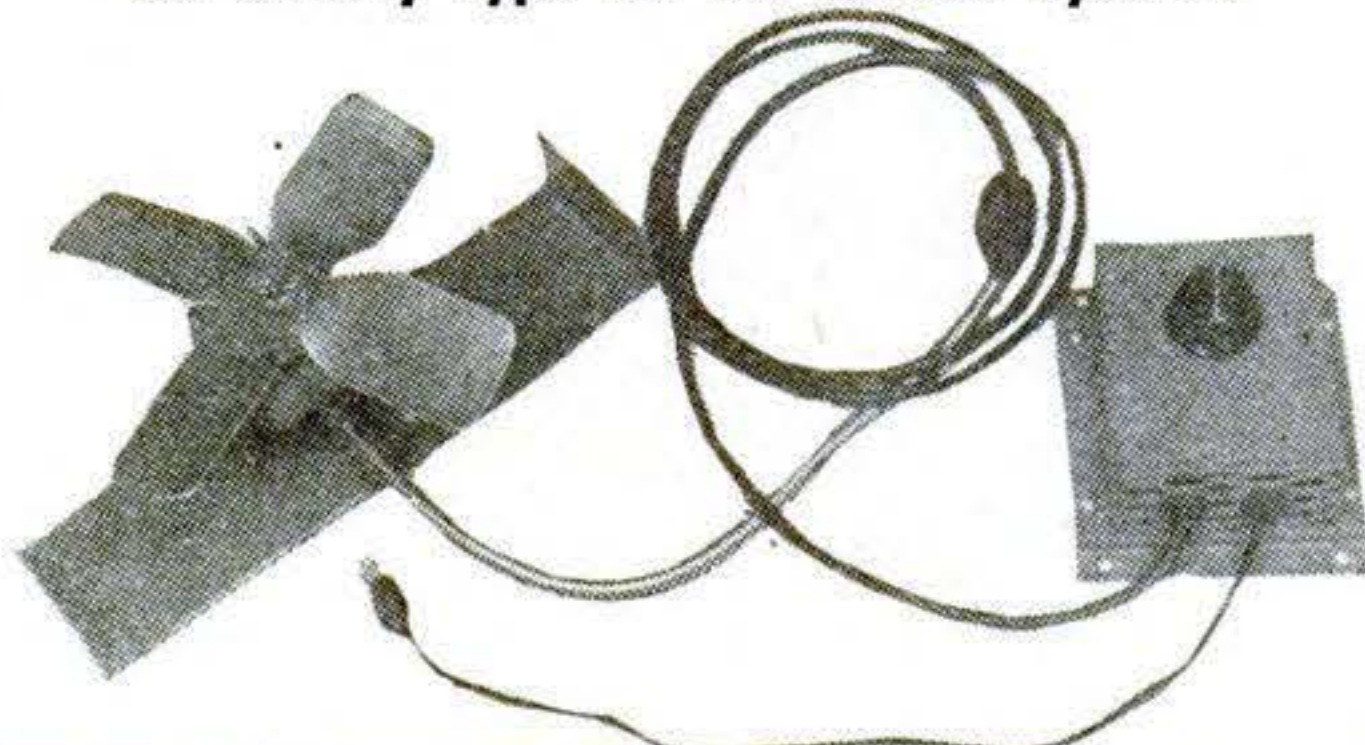
Play Microgroove & Standard Records with this dual Speed Record Player. Dual crystal pickups, 3 tube amplifier, Heavy 5" Speaker, 2 tone leatherette case, Volume & bass controls. Plays 10" & 12" Records. Special **\$39.90** incl. fed. tax. RCA Licensed. Same as above, for Microgroove records only. Attaches to your Radio, phonograph or console **\$19.90**. Remit in full and we pay postage or 25% with order. Balance COD. Order from this ad. Immediate delivery.



Wholesale Distributors, **RISCO ELECTRONICS**, 25 W. B'way, N. Y. 7, N. Y.

306 POPULAR SCIENCE

SAVE HEATING FUEL COST With The **STRICKLAND FUEL SAVING FURNACE BLOWER** For Gravity Type Hot Air Furnace Systems



Fits into cold air inlet, by means of 10" to 24" adjustable bracket, to make efficient blower type heating systems out of old inefficient gravity systems by blowing hot air out of the furnace into desired spaces. Helps to heat upstairs rooms instead of over-heating basements. Greatly reduces fuel consumption at a time most desirable. May be used in summer to help reduce house temperature. Variable Speed Control gives wide range of air volume. Flexible conduit covered cord for protection at cold air grill. Operates in any position. May be used in connection with thermostats or thermostatic furnace switches. Guaranteed against defects in material and workmanship for one year. Price complete as shown, *\$28.50. Without Speed Control and its wiring, for single speed operation, *\$18.50. Sold on 5 days free trial. Shipped prepaid to points within U.S.A., if remittance is enclosed with order, or shipped COD for balance and charges upon receipt of \$3.

STRICKLAND ELECTRIC COMPANY

1427 E. 18th Ave.

Columbus 11, Ohio

*Prices subject to 3% Sales Tax if shipped to points within Ohio.

BARBELLS

95 POUND SET
Only \$10.80
Extra Plates 10c. pound

We have been selling the finest barbell equipment since 1928. We operate our own foundry and sell direct to you at a very low profit. No other company can match our low prices.

Send for our **FREE** Barbell Course and Catalog.

BUR BARBELL CO.
Dept. A
Lyndhurst, New Jersey

NAVY FOUL WEATHER JACKET



**THE GENUINE NAVY N-1 JACKET
MADE TO NAVY SPECIFICATIONS**

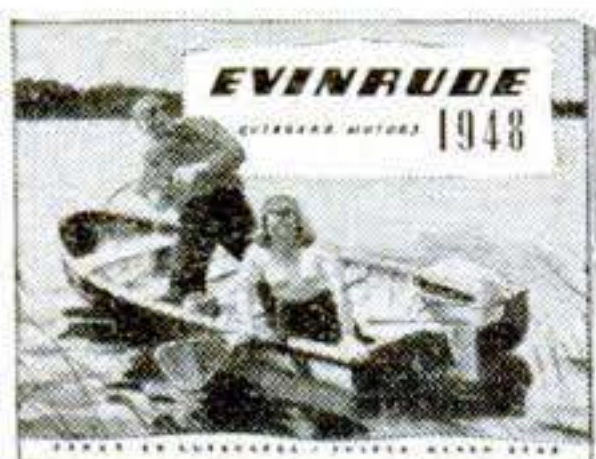
A rough weather jacket. It has everything! Made of durable Mountain Cloth. **BRAND NEW!** Has Alpaca-lined body and sleeves, 2 slash pockets, Zipper front with outside button fly. Draw String bottom. Full 26" length! Zelon water repellent throughout. We offer this exact quality jacket at a tremendous cash saving. Sizes 34 to 46. Save \$7.00. Now only \$15.95! A Xmas gift that would be appreciated. Rush your order **TODAY!**

LEONARDS & LEE SURPLUS SALES

69-71-73 E. 75th St., Dept. NJ-113, Chicago 19

**N-1
\$15.95**

EVINRUDE Catalog Free

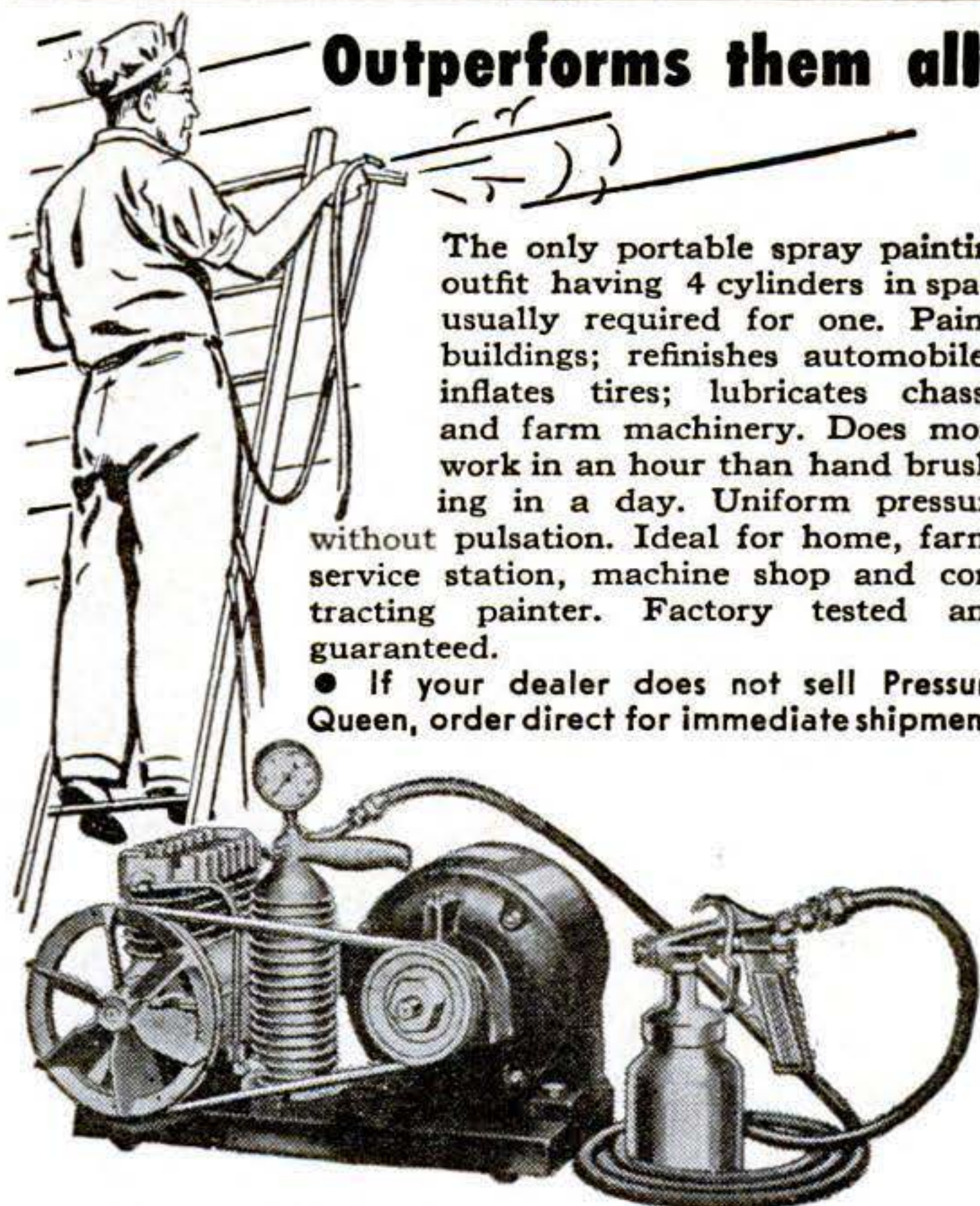


Describes complete line of 1948 Evinrude Outboard Motors—sensational new "Sportwin" model — 2 models with revolutionary "Weedless Drive" — 3 thrilling four-cylinder models. Gives helpful information on boats, speeds, etc. Profusely illustrated. Write

EVINRUDE MOTORS
5842 N. 27th St., Milwaukee 9, Wis.

PRESSURE QUEEN

Outperforms them all



The only portable spray painting outfit having 4 cylinders in space usually required for one. Paints buildings; refinishes automobiles; inflates tires; lubricates chassis and farm machinery. Does more work in an hour than hand brushing in a day. Uniform pressure without pulsation. Ideal for home, farm, service station, machine shop and contracting painter. Factory tested and guaranteed.

● If your dealer does not sell Pressure Queen, order direct for immediate shipment.

THE CAMPBELL-HAUSFELD CO.

151 RAILROAD AVE.

HARRISON, OHIO

safe

FOR FAST BATTERY CHARGING...

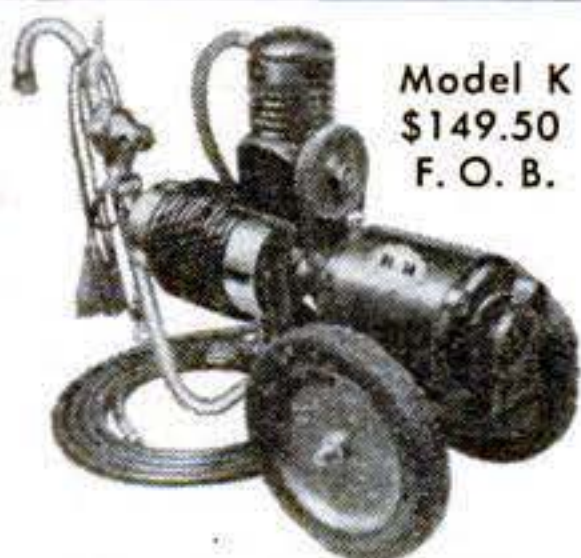


• FAST BATTERY CHARGER & COMPRESSOR

GUARANTEED not to harm batteries. Users all over the world say "Wouldn't be without it!!" **SIMPLE-FAST** and **SAFE TOO!** Starts motors and inflates tires **QUICKLY**. Charges in 30-45 min. Model GKN gas powered for farm use. Model SN, charger only. See your dealer or write factory. **VALUABLE TERR. OPEN FOR SPECIALTY SALESMEN AND DISTRIBUTORS, WRITE NOW. Mfr'd & GUARANTEED by**

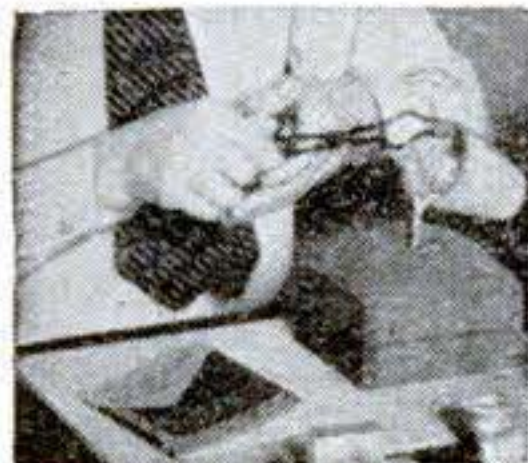
H&H PRODUCTS MFG. CO.

DEPT S 306 BOYD STREET-LOS ANGELES 13, CALIFORNIA



Model K
\$149.50
F. O. B.

Sand Casting—Forging—Heat Treating—Case Hardening **BRONZE FOUNDRY**



In your own workshop allows you to design and build your own GASOLINE ENGINES, STEAM ENGINES, STATUARY, ART OBJECTS, SPECIAL TOOLS, NEW INVENTIONS, ETC. You can also make forgings and case harden steel. Your shop is not complete without a FOUNDRYETTE. Three sizes are available capable of making bronze castings of 1½, 3 and 6 pounds weight, aluminum, copper, brass, etc., \$22.50, \$29.50, \$42.00 f.o.b. Kansas City. Domestic gas supply and 110 volt AC or DC energy required for operation. Write for circular.

KANSAS CITY SPECIALTIES CO.

Box 6022, Dept. S-10

Kansas City, Mo.

now

EVERY CAMERA OWNER CAN MAKE

Better Pictures



To make good pictures you must have proper exposure. Not until the advent of this amazing meter, which uses the new incident light method, was perfect exposure determination possible so swiftly and so surely.

yes — WITH THE

NORWOOD Director
EXPOSURE METER

**EVERY PICTURE YOU TAKE CAN
BE A PERFECT EXPOSURE**

The quickest and easiest to use—the most accurate—and the simplest to understand. No guesswork—only one reading—nothing complicated. The best camera settings for every shot are at your fingertip instantly. Indoors or outdoors—color or black and white—for movies or still pictures the Norwood Director is superior. Available at all camera stores.

Write FOR ILLUSTRATED BOOKLET
"CORRECT EXPOSURE"

AMERICAN BOLEX COMPANY, INC.
521 FIFTH AVENUE, NEW YORK 17, N. Y.

NEW DRAWING DEVICE NOT A TOY

DRAW ANYTHING YOU CAN SEE WITH LUCY!

No talent needed to draw scenery, objects, profiles, portraits or reduce copy, in perfect undistorted perspective, indoors or outdoors.



Ideal Gift

Commercial artists, fashion designers, architects, patent attorneys, hobbyists, doctors, children, find many practical uses for LUCY.

FINE FOR ART STUDENTS

A student looking thru LUCY draws, let us say, the outline of a building. Then, looking directly at the paper without benefit of LUCY'S magic, he fills in other details. Then a glance into LUCY shows where he drew them and where they should have been BOTH AT THE SAME TIME. A perfect art instructor, not a crutch.

LUCY IS AMUSING TOO

If you want to liven up a party, mount LUCY on a table so the guests can draw profiles of each other. Forget all other games. They'll play with LUCY by the hour.

DURABLY MADE, LOW COST

All metal, life-time construction, nothing else to buy, mounts on drawing board or table, no electricity needed, fully guaranteed. Only \$6.95 postpaid with easy instructions. No C.O.D. or open accounts please. One day shipment. A precision instrument you'll be proud to own.

BRUCE ENTERPRISES

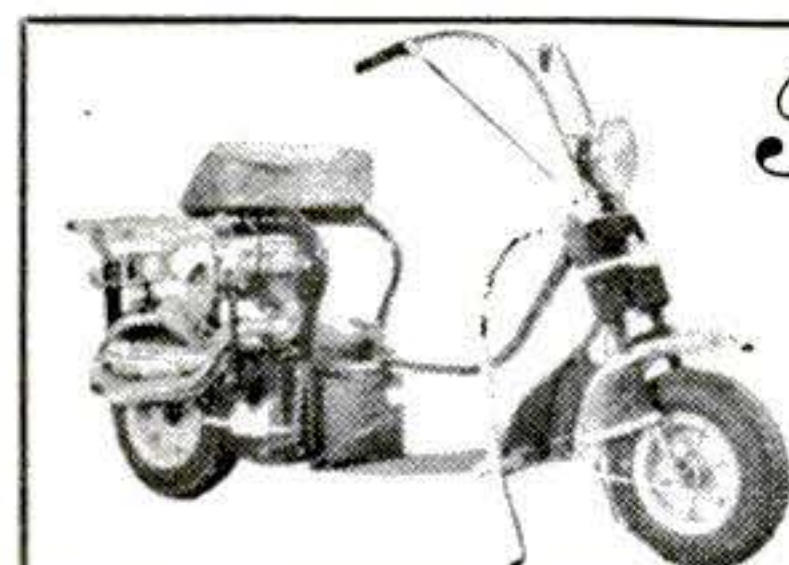
Dept. GH56

North Hollywood, Calif.



HOW IT WORKS

To the operator at B looking thru eyepiece of LUCY at A, a phantom view of subject to be drawn C appears already on the paper D in full perspective. Drawing becomes simple tracing. LUCY does NOT project view of subject to paper. The magic of LUCY'S clever, optical system makes it look that way in eyepiece, and it's just as easy to draw as though it was actually there. Adjustable to vary size of drawing.



Powell SETS THE PACE

DEALER INQUIRIES INVITED

- 7 H.P. Motorcycle-type Engine
- Faster pick-up than a car
- Automatic clutch
- Smooth, simplified control

- Solid steel frame
- Highway cruising speed of 45 miles per hour
- Chrome-plated fenders,

- handlebars, and sport muffler —looks like a custom job
- Costs no more than ordinary scooters

Write for FREE FOLDER and address of nearest dealer

Powell MANUFACTURING COMPANY

DEPT. PS-8
COMPTON, CALIF.

FIRE KILLER

SPECIAL ! ! !
WAR SURPLUS!

CO₂ FIRE KILLER

Instantaneous—Modern—Safe!!
Made by Walter F. Kidde Co.

INSTALL AT DANGER POINT

OPERATE FROM ANY SAFE DISTANCE

Quickly installed anywhere. Just clamp in any position. Run Release Cord to any point. Can be released by simply pulling ball from any distance up to 200 ft. Pull on Cord Smothers Fire with Harmless CO₂ Gas!

Simple... Durable... Foolproof... Rechargeable

\$35.00 value
for

\$5.50

SEND ORDER
TODAY!!

Can be used to inflate any tire by purchasing flexible extension cable for \$1.50. Quart refills \$.50 each.

SMALL CHARGE FOR SHIPPING

Write for our catalog of useful items.

★ **AMERICAN SALVAGE COMPANY, Dept. PS-1** 335 SPRINGFIELD AVENUE
NEWARK, NEW JERSEY



PAINTS

TREMENDOUS SPECIAL
THOUSANDS OF GALLONS OF PAINT

DECK PAINT—For all interior floors, Grey, oak, light brown, dark brown, bright red, mahogany.
Special \$2 a gallon, 60c quart. Outside White, pure Linseed, Lead, Zinc and Titanium, Was \$5.50 gal. Our Price **\$3.50** per gal.
White Enamel, Porcelain finish, \$3.00 per gal.
Flat White, formerly \$3.00, Our Price **\$1.85** per gal.
Flat White—Will cover Calceimine Walls and Ceilings, also Wallpaper without coming off. Was \$4.00, Our Price **\$2.50** per gal.
Gloss White... \$2.00-\$2.75 gal.
Oil Colorings #1 Cans, Chrome Green & Chrome Green Medium, Was \$4.40, Our Price **\$1.15** ea.

The entire inventory of a large, well-known paint & chemical company. Over 50,000 gallons of —Air Dry Enamel—Pastes—Lacquer—Wrinkle Enamel—Baking Enamel—Lacquer. The above paints are in numerous colors (write us for our special color requests)

We also have **Varnishes** (formerly \$5.00 per gal.)
Our Price \$1.29 per gal.
Special—100 gal. lots \$1.00 a gal.

PAINT BRUSHES (Brand New)

- 4" Mongol Pure Bristle Brush... \$1.79
- 4" Nylon, Full, Was \$10.00... Our Price **5.85**
- 7" Kalsamine, Pure Bristle, Formerly \$13.00, Our Price **6.39**
- 7" Pure Bristle, Full, Was \$5.00... Our Price **2.10**
- 3" Pure Bristle, Formerly \$3.25... Our Price **1.65**
- 4" PAINTER'S Full Bristle, Was \$15.00... Our Price **7.50**



GIVE YOUR CAR THE "WOLF CALL"

of Deep Tone DUAL MUFFLERS

The rich, low, mellow sound of "straight thru" ADVANCE mufflers is something all your friends will admire.

Also greater power, speed, and economy result from the reduced back pressure of this scientific design. Rugged steel tube throughout (no aluminum); blowout-proof.

SIMPLE TO INSTALL. No welding, cutting, or holes to drill. Complete with rubber mounted clamps (no rattle) and all necessary fittings.

ADVANCE MUFFLERS, 6800 S. Vermont Ave., Dept. PS11-8, Los Angeles 44, Calif.
Send Check, Money Order, or we will mail C.O.D.

You pay postage upon receipt.

Dual Muffler Set (Ford, Mercury only) \$20.00 ☐ Single Muffler (other makes) \$5.50 ☐
Single Muffler (Ford, Chev., Plym.) 4.86 ☐ 2 1/2" Chrome tail pipe tips 1.75 ☐

Car make _____ Year _____ Model _____

Name _____

Address _____ City _____ State _____

ADVANCE MUFFLERS
6800 S. Vermont Ave., Los Angeles 44, Cal.

"Powertwist" VERSATILE PRECISION Power Tool

LEADER IN ITS FIELD—THE TOOL WITH MANY USES

**FOR SAWING—DRILLING—ROUTING
MORTISING—GRINDING—POLISHING**

**Flex Shaft and Foot Control Easily Attached
for Carving, Engraving, Die Sinking, Deburring**

"Powertwist" is the all-purpose tool which provides accurate, dependable control over your work by utilization of a sturdy adjustable table, which is complete with fence and means for special adjustments. The "Powertwist" is a high precision tool capable of the finest operations. Ideal for home workshop, machine shop, pattern shop, dental laboratories and schools. Especially adapted to production work because of its design and rugged construction. "Powertwist" is equipped with a powerful, dependable, high torque ball-bearing motor, air cooled and rubber mounted. Turns 20,000 R.P.M. Operates on 115 Volts A.C. or D.C. and has a 1/4" capacity key tightening three jaw chuck.

The overall dimensions are 14" long, 6" wide, 5 1/2" high. Table is 6" long, 3 3/4" wide. Castings are made of "aluminum alloy" that will withstand severe shock.



**LATHE
JOINTER
DRILL PRESS
SPINDLE SHAPER
TILTING TABLE
with Complete "Powertwist"
Shop attachments**

"Powertwist" operates with all standard steel cutters, mounted wheels, router bits, drum sanders, and saws with 1/4" or less mandrel or shank. The "Powertwist" potential uses are only limited by the ingenuity of the user.

**THE
GREATEST
VALUE
\$29.75
IN THE POWER
TOOL WORLD**

"Powertwist" tools are sold on a money-back guarantee. If your dealer doesn't carry "Powertwist" tools, order direct TODAY. Send check or money order. \$5.00 deposit required on all C.O.D. orders.

DEALER INQUIRIES INVITED

**PIONEER POWER TOOL COMPANY, Dept. PS-11
109-111 St. Louis Ave., Las Vegas, Nevada**

Enclosed please find.....to cover cost of "Powertwist." Please ship at once.

Special-Standard Model, single speed, 1/4" chuck, chuck key, adjustable table and fence. \$29.75. Large saw and mandrel included.

Name

Street

City..... State.....

IDEAL CHRISTMAS GIFT FOR THE HOBBYIST

OVER 250 SURPLUS BARGAINS

Write for FREE Catalog
PS-11 Today!

TYPE B-3 FLYING JACKETS

Genuine Air Force issue! Fine quality seal brown leather, adjustable waist and collar straps, sheep lined, zipper closure. Reconditioned. Sizes 36-46. A \$30.00 value! Only **\$15.95**

TYPE D-1 JACKET. Similar to type B-3 but lighter in weight. Zip front, long wearing. Reconditioned State size. **\$9.88**

FAMOUS U. S. NAVY N-1 DECK JACKET
Alpaca pile lined. Poplin outer shell. Zip front, outside button fly, draw string bottom. 2 slash pockets. Knit wristlets in cuffs. Sizes 34-46. Brand New! **\$14.88**



GENUINE ARMY BLANKETS

Finest 100% wool blankets issued! Soft, soil resistant nap. Olive drab, cleaned, guaranteed perfect. This quality in civilian colors sells for \$12.50. Wgt. 4 lbs. **\$3.88** 2 for \$7.50

BRAND NEW O. D. ARMY BLANKETS
Right out of orig. govt. cases. Size 68"x86". 4 lbs. **\$4.88** 2 for \$9.50

TYPE A-10 FLYING GLOVE

ORDER NOW! **NEW!**
Soft, brown pony leather, wool lined. Knit wrist. A \$5.00 value! Sizes 8 to 10. **\$2.50**



GENUINE US NAVY LAST OXFORDS

The most comfortable shoe made! Finest quality leather. Fits like a glove, outlasts ordinary shoes, ask any Navy man. Now! in all widths, B-C-D-E. Supply limited. Order today! State size. **\$6.88**



BROWN ARMY OXFORDS—\$6.88
Same fine quality as Navy oxford, top grain calf, all widths, B-C-D-E.

NEW! TYPE B-3A FLYING GLOVE

BOTH Only \$2.88
A real beauty. Soft, fine supple brown leather. Fits like your own skin. Brown separate liner for extra warmth. Sizes 8-9-10-11. Leather gloves with rayon liners. Both complete for only \$2.88.



AIR FORCE FLYING TROUSERS

LEATHER • SHEEP LINED! Brand New! The Navy's finest! Zippers entire length of pant. Suspenders included. All sizes. Government cost over \$20.00. State waist size and length. **\$8.88**



AAF ALPACA LINED PANTS

ALPACA LINED THRU-OUT! Weatherproof poplin outer. Complete with pockets, zippers and suspenders. Warm, light weight. State waist size. **\$6.88**



A-9 FLYING GLOVES
\$10.00 wouldn't buy a better mitt. Warm, fleecelined, soft deer-skin. New! Large only. **\$4.98**

JACKET—SHEEPLINED TYPE AN-J4

Genuine Air Force Issue! The Air Corp's finest jacket. Top grade leathers, trimmed at cuff and waist. Ex. lge. sheeplined collar. Adj. tabs at side, zip front. Reconditioned. \$42.50 value. Med. sizes only. **\$19.50**



B-11 A.A.F. PARKA

Alpaca pile lined body and sleeves, mouton hood. Poplin outer shell. Knit wristlets inside sleeve. 4 pockets. Zip front. Draw string hood. Adj. sleeve tabs, sizes 34-46. **\$24.88**



HONEY OF THE TANK CORPS TANKER JACKET

Poplin outer shell. 100% wool OD lining, wool knit semi-turtle neck, wristlets and bottom. Zip front, slash pockets. **\$9.88**



- Navy Battle Lantern. New. 3.95
- Army Shoe Pacs. New. State size. 5.95
- Army Wool Shirts. Recond. Perfect. 13 1/2 to 15 1/2. 2.95
- Navy Grey Raincoat. 36-42. 3.88
- A-6 Boots. Sheeplined. (Reconditioned). 6.95
- AAF Wool Gab. Coveralls. New. Sizes 36 to 42. 8.88
- Tents - Tarps - Tools, etc.

FISLER SALES CO. 723 Walnut St. Kansas City 6, Mo.

Mail orders add 10% or include sufficient postage. Any overage will be promptly refunded. Complete satisfaction guaranteed.



SANTA SAYS!
"A WONDERFUL HOBBY
WORKSHOP GIFT!"

Just dial ANY WIDTH CUT
ON YOUR SAW



WITH

DADO SAWING WASHERS

Warren

Cut clean, accurate, parallel grooves—12 widths, any angle. No chatter, burning, chewing—or sanding! No more blade vibration—no screws to fuss with—just four balanced washers. Simply dial desired width with Micromatic adjustment. Can be left on blade for straight cuts. 5 sizes fit any arbor— $\frac{1}{2}$ ", $\frac{3}{4}$ ", $\frac{5}{8}$ ", 1", $1\frac{1}{8}$ ". A perfect gift for woodworkers. See your dealer or use coupon below!

DEALERS, ORDER DIRECT!

WARREN WASHERS CO., DEPT. 51
70 Medbury, Detroit 2, Mich.
Enclosed \$4.95 for one set of Warren Washers, postpaid.

MY ARBOR
SIZE _____

NAME _____

ADDRESS _____

CITY _____ STATE _____

\$4.95
SET

Electrify MOTHER'S OR WIFE'S SEWING MACHINE!

MAKES SEWING
A PLEASURE!

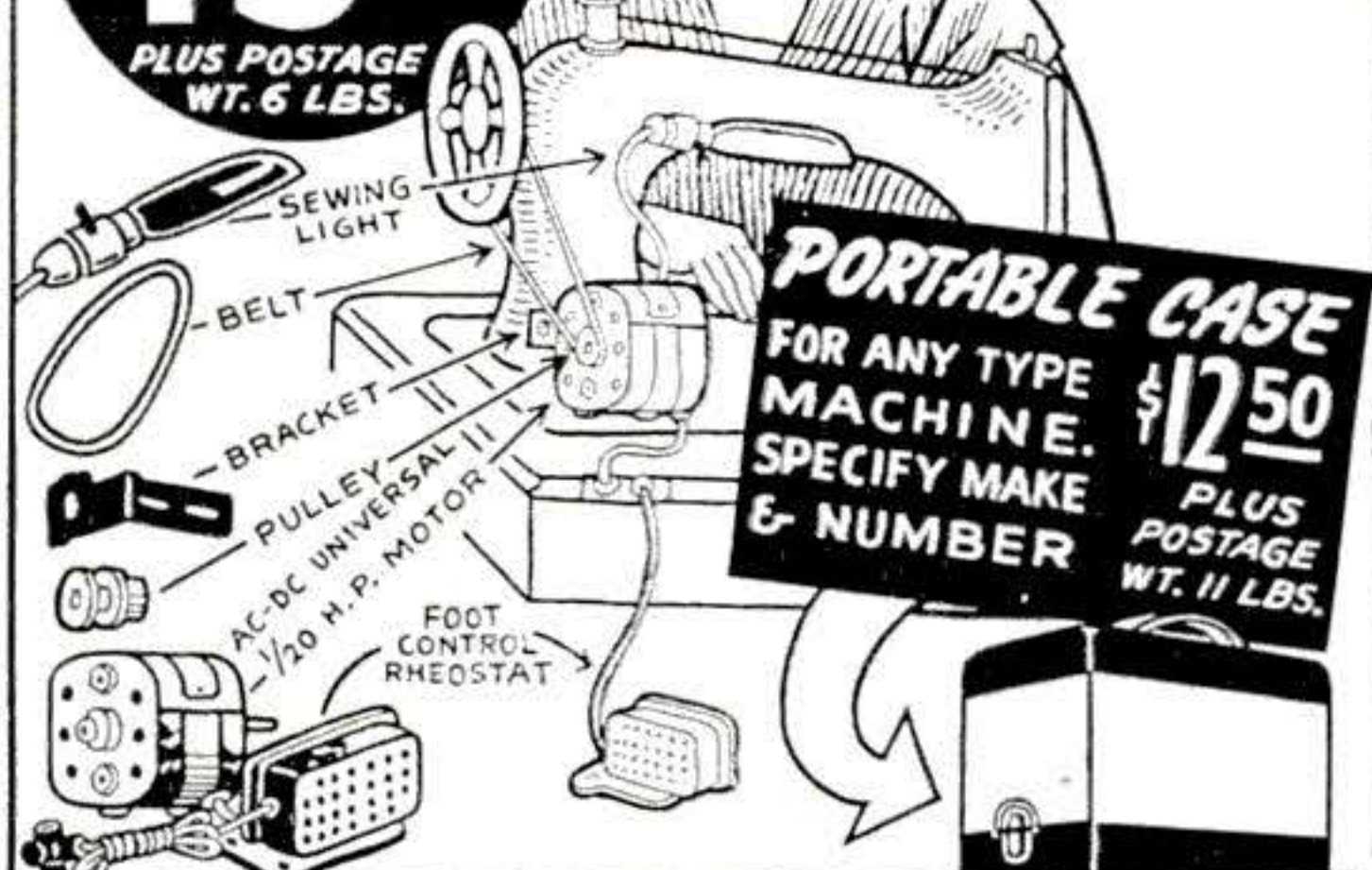
ANYONE CAN
INSTALL

COMPLETE
WITH
SEWING LIGHT

\$15.95

PLUS POSTAGE
WT. 6 LBS.

OUTFIT CAN
BE USED FOR
HOBBY WORK,
SHOP, ETC.



PASAAK'S DEPT. PS 343 CANAL ST.,
NEW YORK 13, N. Y.

ARC WELDING
FOR PROFIT OR PLEASURE

EASY TO OPERATE—EASY TO ASSEMBLE

60 LBS.
READY MADE
PARTS
Only
\$24.95

OWN THIS GENUINE INDUSTRIAL-
TYPE HEAVY DUTY WELDER

Ideal for all-purpose welding. SAFE, RUGGED, COMPACT and EFFICIENT. WILL OPERATE FOR ONLY A FEW CENTS PER DAY. Plugs into 110 or 220 AC line. Can be used consistently on 30 amp. fuse. ALL PARTS DESIGNED TO GIVE LIFETIME SERVICE. Why pay expensive assembling and shipping costs? ATOMIC WELDER PARTS come in a compact box—YOU SAVE THE DIFFERENCE! ORDER WITH CONFIDENCE!

Try your ATOMIC WELDER for 30 days. If not satisfied, return as is. Your money will be refunded with no questions asked. IMMEDIATE DELIVERY—WRITE FOR FULLY ILLUSTRATED BOOKLET S-11

ATOMIC WELDER CO.

3039 So. 19th St., OMAHA, NEBR.

Sold on 30 Day Money-Back Guarantee.

ALL-WEATHER JACKET

TOP QUALITY—ECONOMY PRICED



Not an imitation—the genuine Army B-11 Jacket—**BRAND NEW!** Completely water-proofed! Wind resistant! Made of durable Mountain Cloth to meet the most rigid U.S. Army Specifications! Body and hood Alpaca-lined! When unzipped, hood makes full shawl collar. All wool-lined sleeves. Elastic gathered back. Perfect for sportsmen, workers, farmers, etc. Normally retails for \$30.00. We offer this same jacket for only \$19.95! Sizes 34 to 46. Would make the perfect Christmas gift. **SEND NO MONEY.** Just name, address, size. Pay postman only \$19.95 plus charges on delivery. Cash orders sent postpaid.

LEONARDS & LEE SURPLUS SALES

69-71-73 E. 95th St., Dept. WJ-123, Chicago 19

B-11
\$19.95

MORE NEW CARS AND
TRUCKS ARE EQUIPPED WITH

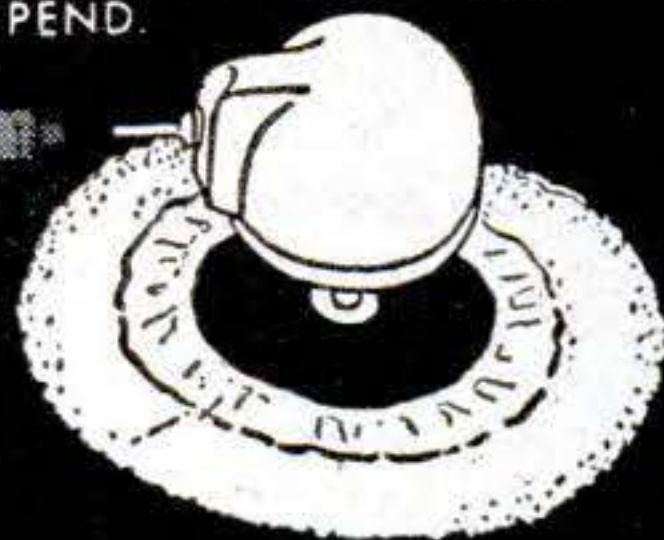
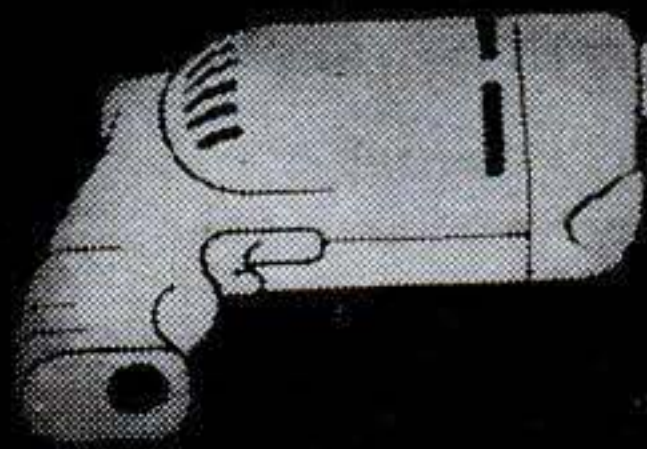
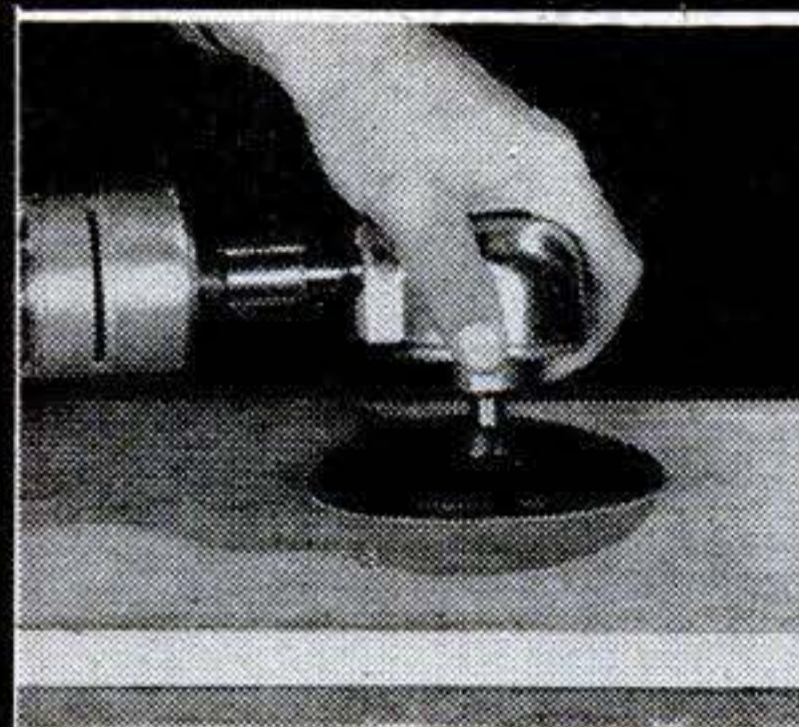


SPARK PLUGS

THAN WITH ANY OTHER MAKE

THE BULL BUFFER

PAT. PEND.



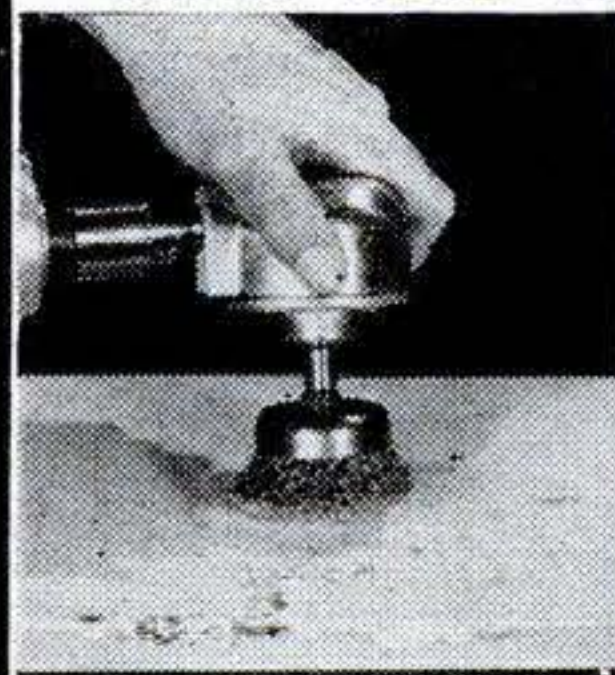
You polish and sand faster, easier — do beautiful, professional work—with this amazing new attachment for your hand drill. And it more than pays for itself the very first time you polish and sand your car, floors, woodwork, furniture. The Bull Buffer fits any chuck on an electric drill

(or flexible shaft). It's the only buffer you can turn in a complete circle while you hold your hand drill stationary. Reaches all curved and flat surfaces. It's packed with power, built of lifetime materials and guaranteed.

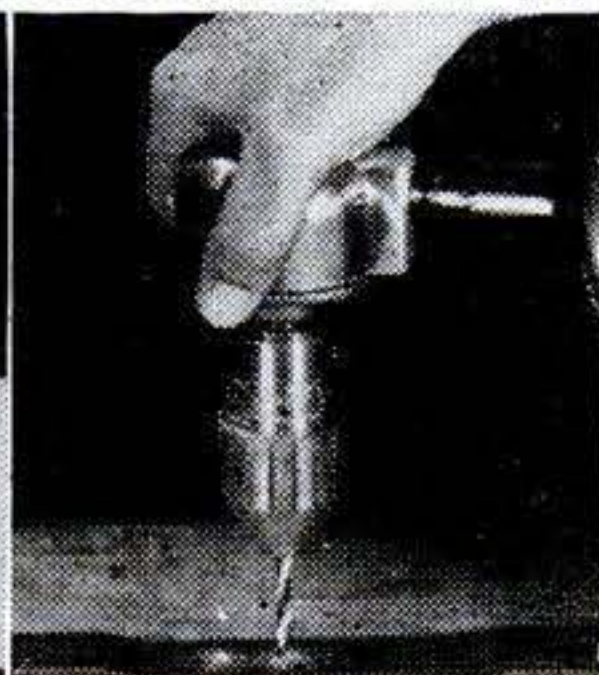
If your dealer doesn't stock, send cash, check, or money order for your Bull Buffer, complete as pictured below.....

\$9.95

ORDER THESE ACCESSORIES FOR YOUR BULL BUFFER:

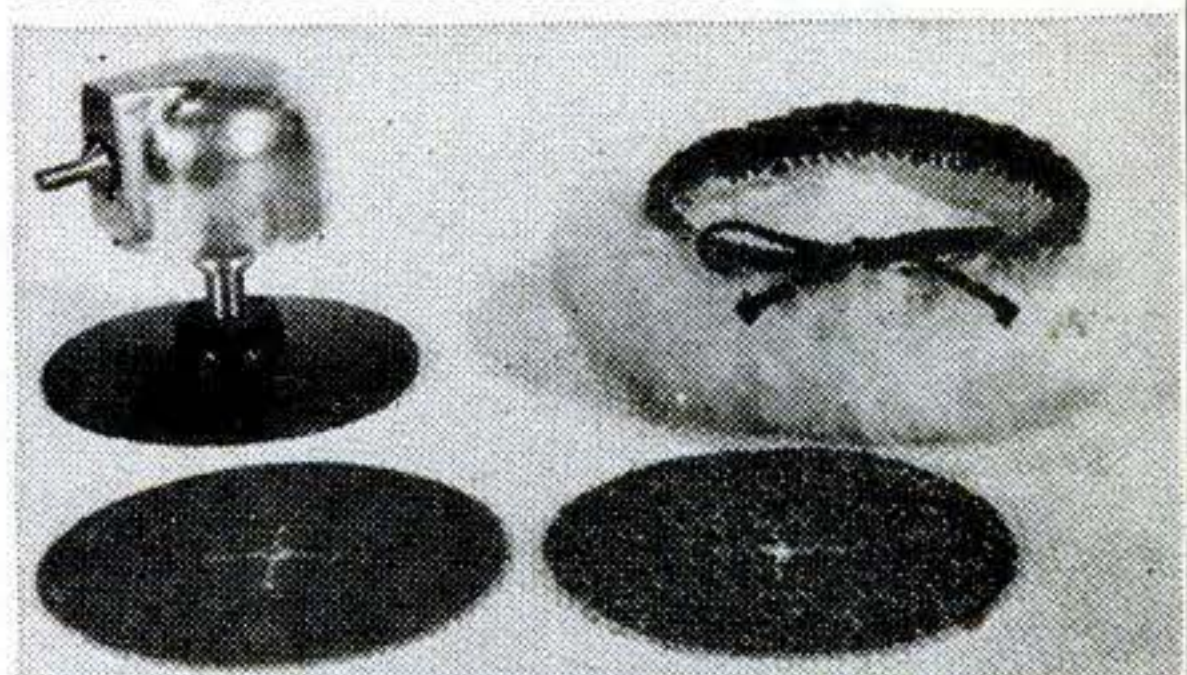


Cup wire brush attachment for removing paint, rust, scale, etc. **\$1.75**



Jacobs key chuck increases 1/4" drill to 1/2" capacity—reduces speed, increases power. **\$5.00**

- Bull Buffer car cleaner **\$.50**
- Bull Buffer car polish **1.00**
- Extra sheepskin bonnet **1.25**
- Extra sanding discs (000-00-0-1-2 1/2-3-4) ea. **10c**
- 1/2" Jacobs No. 6425 key chuck (see photo) .. **5.00**
- 2 1/2" cup wire brush (see photo) **1.75**



Bull Buffer comes complete with 5-inch rubber disc, sheepskin bonnet, and 2 sanding discs, only **\$9.95**.

BERTRUM G. ENGINEERING COMPANY

3121 MAIN ST.

Dealers write for information

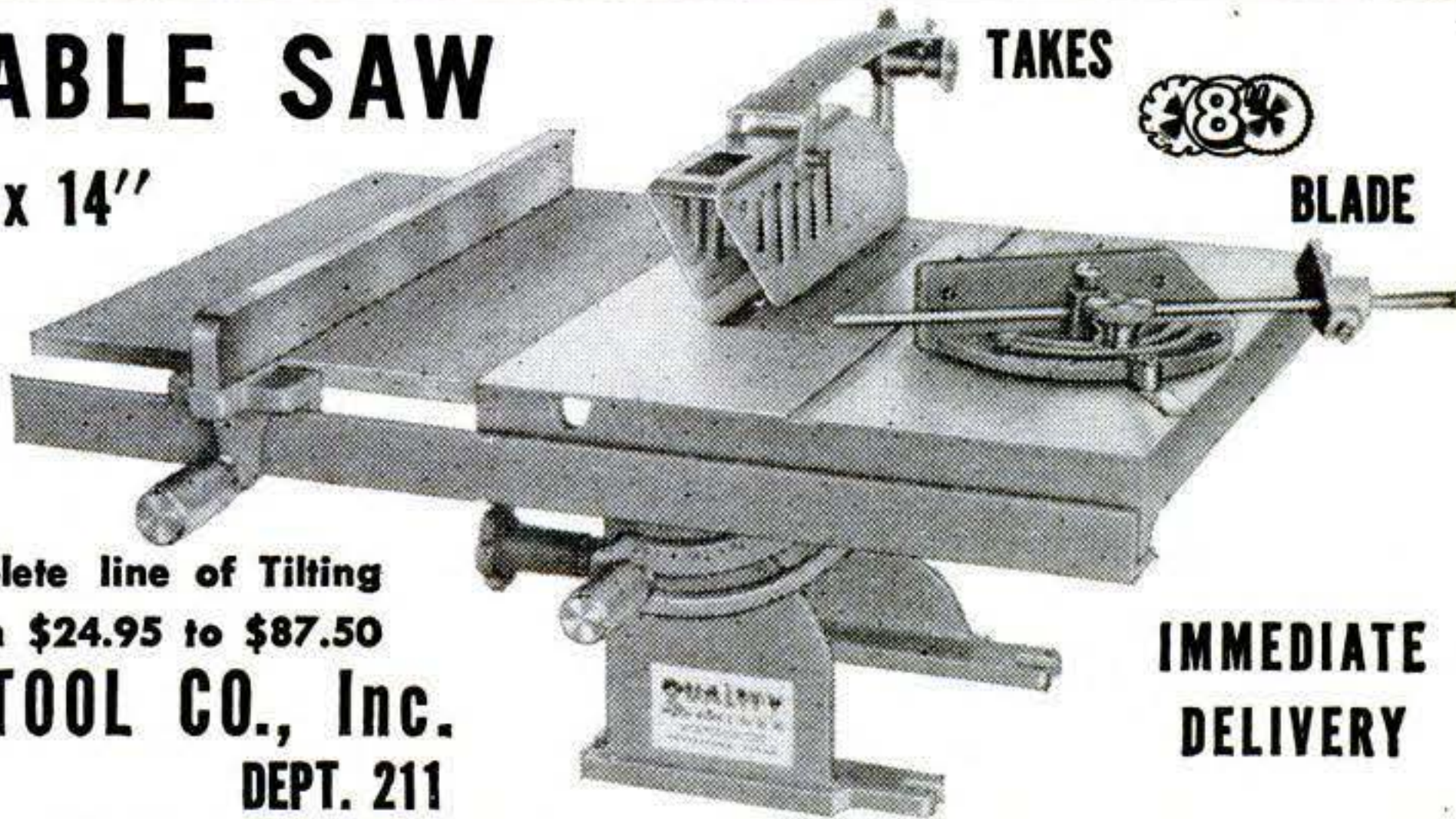
KANSAS CITY, MO.

QUALITY TILTING TABLE SAW

TABLE INCLUDING EXTENSION 18" x 14"

\$24.95

Complete as shown
F.O.B.
Royersford, Pa.



IMMEDIATE
DELIVERY

Send for catalogue showing complete line of Tilting Table and Tilting Arbor Saws, from \$24.95 to \$87.50
AMERICAN MACHINE & TOOL CO., Inc.
ROYERSFORD, PA. DEPT. 211

FREE Sample Of New PLASTIC Shows How To Make Leather and Leatherette LIKE NEW!

MAGICALLY CHANGES CLOTH TO IMITATION LEATHER

SAVE MONEY - TIME AND EFFORT by renewing Luggage—Leather Covered Furniture—Golf Bags—Auto Seat Covers—Restaurant Furniture, Booths or any Leather or Leatherette item with new plastic discovery called Leather-New. Coat cloth or cloth covered items such as Glider Cushions, Tarpaulins, Porch Furniture, Etc. and make them look and wear like they were leather. Spreads easily with brush or spray gun—leaves NO BRUSH MARKS. Simple Acids, Caustics and Alcohols do not stain this finish—It is sun and mildew proof. Stays Fresh and Clean as long as real leather. Comes in all standard colors. Just mail coupon for Free sample of Leather-New coated material which shows effects.

LEATHER-NEW PRODUCTS, 4723 Troost, Dept. S-7, Kansas City, Mo.

OWN A PROFITABLE LIFETIME BUSINESS

Cash in on big profits to be made in this new business—Profits up to \$700.00 monthly possible, renewing booths and furniture for bars, restaurants, grills, movie houses, etc. Mail name and address on 1c postcard—I'll show you how. **Jack Edwards, Sales Mgr.**

JUST MAIL COUPON

No Obligation

Leather-New Products,
4723 Troost, Dept. S-7, Kansas City, Mo.

Name.....

Address.....

City..... State.....

Fill Out—Mail Today

NOVEMBER 1948 311

Announcing

THE
REVOLUTIONARY
NEW
BOICE-CRANE



FRICTION-MATIC WET TOOL GRINDER

SIMPLIFIED SELF-ADJUSTING FRICTION ROLL DRIVE. No countershaft or extra belt. PERIPHERAL SPEED REMAINS CONSTANT AS WHEEL WEARS. Exclusive feature. NO WATER THROWN ON OPERATOR. Has "controlled-water action".

PERMITS PROPER PRESSURE CONTROL.

Operator takes a comfortable standing position and works on top of the wheel. LARGER TOOL REST (2½" x 5"). Perfect for long, slim knives, wide tools.

ACCURATE CONTROLS FOR GRINDING ANGLES FROM ZERO TO 30°. First tool rest with adequate adjustment.

8" DIAMETER and 1½" FACE SANDSTONE WHEEL. 135 r.p.m. increasing as wheel wears to maintain peripheral speed of approximately 280 feet per minute.

GRAY ENAMELLED STEEL CASE. 16 gauge. Weight 14 lbs. net; 17 lbs. packed.

Only \$14.95

Order today from
Power Tool Dealers Everywhere.

BOICE-CRANE COMPANY
944 CENTRAL AVENUE • TOLEDO 6, OHIO

THICKNESS PLANERS • SPINDLE SHAPERS • SAW-JOINTERS • LATHES • TILTING-ARBOR SAWS • BELT SANDERS • SPINDLE SANDERS • BAND SAWS • JIG SAWS • DRILL PRESSES

**WAR
SURPLUS**
**NYLON
THREAD**



*Amazing Strong
Thread used to
sew Parachutes*
**NOW AVAILABLE
For Home Use...**

This genuine Du Pont Nylon thread is practically unbreakable. What every hobbyist, sportsman, sailor, camper wants. Used in model making, sail mending, tent repairing, bow and arrow winding, bamboo rod wrapping, kite flying and repairing, and many other uses. Used by Air Force on parachutes because of its amazing strength and dependability. Here is your chance to get a giant spool of 5000 feet—almost a mile of Nylon thread—at the sensational low war surplus close-out price of only \$1.69. Black or white. Order TODAY.

GIANT SPOOL

only
\$1.69
BLACK or WHITE
APPROX 5000
FEET

SEND NO MONEY, TEST AT OUR RISK

Just send your name and address. Specify white or black or two giant spools for only \$3.29. On arrival, deposit only \$1.69 per spool (\$3.29 for two spools) plus C.O.D. postage on our guarantee if you are not delighted, you can return in 10 days and your money back. Cash with order, we pay postage. Limited Supply. Write Today.

LEEWARD PRODUCTS
Dept. F48P, 189 W. Madison St., Chicago 2, Ill.

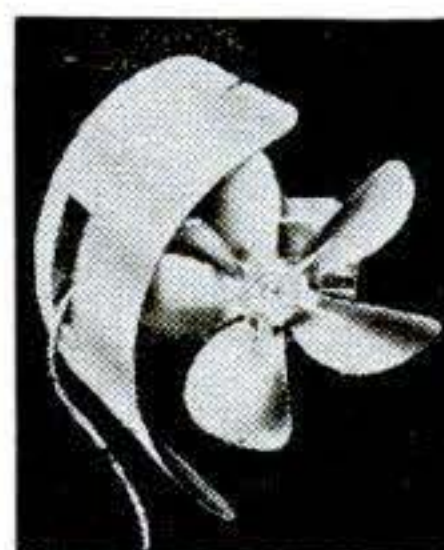
**GLOWS
in the
DARK**

5

**FREE
Sample!**

Be the first to sell luminous house numbers, light switch plates, wall protectors, pull cords. Also luminous pictures, statues, decals, and a host of religious, nursery and other objects that glow in the dark. Get into this new and growing industry. Enormous demand... no competition... sensational demonstration... big profits. Represent a large manufacturer, established over 34 years. Write today for liberal money-making offer and free sample to show how they glow in the dark.

**MADISON MILLS, 303 Fourth Ave.
Dept. L-5 NEW YORK 10, N. Y.**



HEAT THAT COLD ROOM
McLARTY VENTILATED BOOSTER FAN

INSTALL IT YOURSELF!

Get immediate heat in that cold room with this easy-to-install booster fan. Quiet, cool running, efficient. Fine for shop, bedroom, recreation room, or hard to heat places. Fits pipe sizes 8 to 12", runs on house current. If your hardware or furnace dealer cannot supply you, send money to:

McLARTY SYSTEMS

**209 W. MICH. AVE
BATTLE CREEK, MICH.**

**\$10.95 F.O.B.
Factory**



*"We needed some extra rooms in a hurry,
so when we found out that Weldwood Glue is so strong..."*

When you want a wood-to-wood bond that will really hold... remember Weldwood Glue. It's quick to mix... easy to use... tremendously strong... stain-free... rot-proof... and permanent. At hardware stores, lumber yards, chain stores, in 15¢, 35¢, 65¢, 95¢ and larger sizes.



WELDWOOD
PLASTIC RESIN GLUE

United States Plywood Corporation, New York 18, N. Y.

You "PLATE" when you LUBRICATE WITH GRAPHITE!



Whether you apply a graphite powder, a graphite stick, a graphite grease or a graphite oil, an adequate amount of graphite becomes microscopically deposited or "PLATED" on the wearing surfaces!

This lubricating "plate" of graphite stubbornly resists the extremely destructive forces of friction, pressures, speeds, heat, cold and solvents that decompose or displace ordinary lubricants. You'll be amazed at how much

more effectively the plating action in *Graphite Lubrication* reduces wear, saves lubricant and labor.

There is a ready-to-apply GRAPHITE "PLATING" LUBRICANT for nearly every use in every home, industry, auto, boat, railroad, airplane etc. Illustrated here is one typical product of each of these four types of Dixon's Graphite Plating Lubricants stocked by the nation's supply houses.

POWDER
Dixon's Graph-Air Gun,
Type 4... 40¢



STICK
Dixon's Slipstik
20¢

GREASE
Dixon's Cup Grease
No. 3... 60¢ 1 lb. can



OIL—Dixon's
Lubricating &
Penetrating
Oil... 30¢

DIXON'S GRAPHITES

JOSEPH DIXON CRUCIBLE COMPANY

JERSEY CITY 3, N. J.

DIVISION 27-KP-11

MAILED FREE for the asking—this Data Sheet Directory shows what free descriptive printed matter is available on 20 Dixon Lubricating "Plating" Graphites.



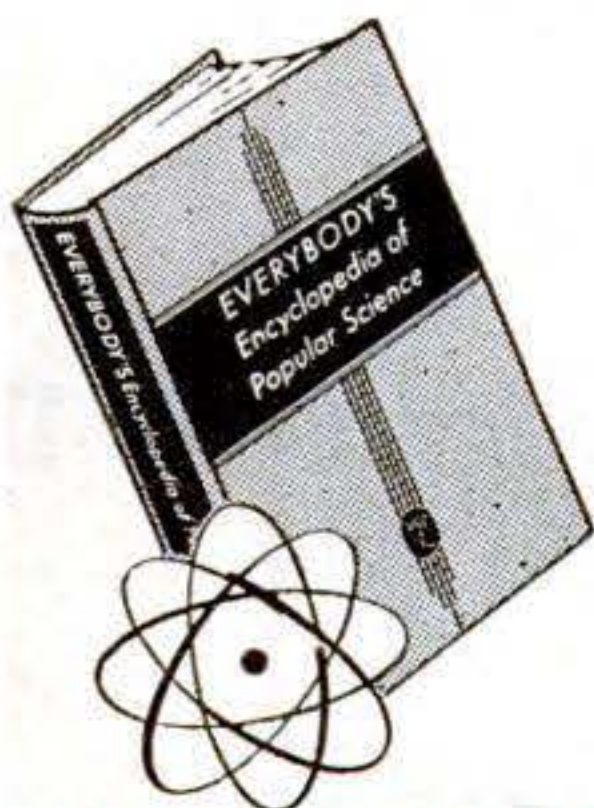
Choose YOUR CHRISTMAS GIFTS from this famous Popular Science Monthly Library of HOW-TO-DO-IT BOOKS!

Just pick out the books you want from this exciting assortment! Here are books for every member of the family—books for Dad and Mother, for the young folks, for handicrafters, hobbyists, workshoppers, radio experimenters and others. These are perfect gift books,

bound in handsome, lifetime DeLuxe Editions. And every book is backed by *Popular Science Monthly's* unconditional guarantee of money back in 7 days if not delighted. Don't delay—pick the books you want and send your order today!

A SPLENDID GIFT FOR THE WHOLE FAMILY!

Everybody's Encyclopedia of Popular Science



This one-volume Science Encyclopedia answers all your questions on an amazing range of subjects, from the workings of the sun and stars down to the tiny structure of the atom. Overflowing with thousands of vital facts brought to you in factual, easy-to-understand, question and answer form. All about the human body, muscles, glands, X-

rays, energy, chain reaction, elements, atoms, electrons, Einstein theory, food chemistry, industrial science, story of the Earth, evolution, radio, television, electronics, psychoanalysis, hypnotism, etc.—all made clear and simple. Exciting reading now—and a wonderful reference volume for years to come. *Only \$2.49.*

Books That Every Home Owner Should Have!

TINKERING WITH TOOLS



Shows you how to save *up to 50%* on home repairs—and have lots of fun besides—just by following the simple, easy-to-do instructions in this big, 260-page book! Tells everything you need to know about woodworking, shingling, plastering, plumbing, electric wiring, masonry, etc. Jam-packed with money-saving kinks that teach you how to repair faucets, valves and traps; refinish floors and furniture; renew sash cords, stipple walls, make hundreds of other repairs and improvements around the house. Hundreds of pictures. *Only \$1.49.*

FIX IT YOURSELF

How to save expense by doing your own easy repair jobs. Simplified methods, with diagrams, show how to fix and repair furniture, electric outlets, windows, doors, leaky pipes, floor boards, chimneys, boilers, weather stripping, painting and hundreds of other construction and repair jobs. Packed with ideas for every room in your house. Full easy-to-use index for emergencies. *Only \$1.49.*

Exciting Home Workshop & Handicraft Manuals

COMPLETE Home Workshop Manual

Actually 12 books in 1, with a dozen big sections devoted to home repairs, radio and electronics, furniture you can make, auto ideas, woodworking, heating and plumbing hints, toy-making and magic, photography, model-making, home science experiments, use of hand and power tools, and gardening help. A big 576-page book. 1756 illustrations make everything clear. *Only \$2.98.*

NEW Home Workshop Manual

Biggest workshop book yet—580 pages, over 1500 pictures, photos and diagrams. Hundreds of hours of workshop fun making things out of wood, metal, plastic, etc. Direction for building furniture and shop equipment, caring for tools, building model planes and railroads, using machines correctly, etc. *Only \$3.48 in DeLuxe Edition.*

HOW TO GET THE MOST Out of Your Home Workshop

Big, practical workbench manual for both beginner and expert. Covers use of all hand and power tools; shows how to build attachments that make one tool or machine do the work of several. Special section tells how to set up your workshop on budget plan, make it grow with your experience and needs. *Only \$2.73 in Aluminum-Stamped DeLuxe.*



- And Accept THIS \$1.98 CLOTH-BOUND BOOK AS OUR FREE GIFT TO YOU!

Just order any two or more of the thrilling how-to-do-it books on these pages—and receive this big, 192-page clothbound book—regular price \$1.98—as our FREE Christmas gift to you!

Wonderful New Book for the Woman in Your Life!



How to Make PAPER FLOWERS and PARTY DECORATIONS

Brand-new *Popular Science* book for women! This big, 256-page book shows 1,001 things you can make out of paper—flowers, gifts, novelties, etc. Exciting party ideas for Christmas, New Year's, Valentine's, etc.—grand how-to-do-it information on making favors, place cards, centerpieces, costumes, decorations, novelties. Tips on money-saving ideas for dressing up home, church and club with inexpensive papercraft items. 700 illustrations—many full-size patterns! *Only \$3.48 DeLuxe.*

Grand for Men and Boys of All Ages BOY'S FUN BOOK

192 pages of games, tricks, projects, hobbies, puzzles, science experiments, models, radio plans, dog-training methods, whittling projects, lariat tricks, etc. Illus. *Only \$1.98 DeLuxe.*

EVERYBODY'S RADIO MANUAL

Step-by-step instructions for building and trouble-shooting all sorts of radios. Shows how to solder, drill, read wiring diagrams, make testing instruments, make repairs at home, etc. *Only \$1.49.*



RADIO for the MILLIONS



Packed with clear, foolproof instructions for making an 8-tube FM receiver, bicycle radio, 2-tube set, floor-lamp radio, midget portable, high-fidelity amplifier, bedside radio, and 71 other radios, phonographs, recorders. *Only \$1.98 DeLuxe.*

BOATS Anyone Can Build

Pick the boat you want from 25 plans—this book shows how to do the rest! Instructions, diagrams, blueprints for making over two dozen motorboats, sailboats, outboards, runabouts, dories, skiffs, canoes, dinghies, rowboats, etc. *Only \$3.48 DeLuxe.*

How to Build CABINS

Shows how *anyone* can build a magnificent cabin, hunting lodge, tourist home or bungalow in record time. Jam-packed with 256 big pages, 180 diagrams, charts and floor plans. Answers all your questions on laying floors and foundations, building walls, shingling roofs—even installing plumbing and wiring. *Only \$2.48 in DeLuxe Edition.*

FREE Gift Coupon—Mail Today!

Popular Science Monthly, Dept. X-118
353 Fourth Avenue, New York 10, N. Y.

Send the books I have checked below. When they arrive I'll pay postman total price shown, plus a few pennies postage. If not delighted I may return books in 7 days and you will refund my money.

- | | |
|--|--|
| ☐ I've ordered 2 or more books. Send extra \$1.98 192-page book to me FREE! | ☐ How to Make Paper Flowers, \$3.48 |
| ☐ Everybody's Encyclopedia of Popular Science, \$2.49 | ☐ Boys Fun Book, \$1.98 |
| ☐ Tinkering with Tools, \$1.49 | ☐ Everybody's Radio Manual, \$1.49 |
| ☐ Fix It Yourself, \$1.49 | ☐ Radio for Millions, \$1.98 |
| ☐ Complete Workshop Manual, \$2.98 | ☐ Boats Anyone Can Build, \$3.48 |
| ☐ New Workshop Manual, \$3.48 | ☐ How to Build Cabins, \$2.48 |
| ☐ How to Get the Most Out of Your Workshop, \$2.73 | |

Name.....

Address.....

City.....Zone...State.....

☐ Check here, send payment now and we will pay postage. Same refund guarantee.

Money is unimportant here!!



Land of Cockaigne (COCKAYNE) This is a modern artist's idea of that delightful paradise which was part of the folklore of Europeans many, many centuries ago.

This is the Land of Cockaigne.

It's a wonderful place where the houses are built of cake, and the shops are eager to give you their merchandise for free.

Here, roast geese and other fowl wander about inviting folks to eat them. Here, buttered larks fall from the skies like manna.

Wonderful place, Cockaigne . . . this land that's always free from want . . . where business cycles are unknown . . . where money is unnecessary.

Only trouble is you won't find this mythical place on any up-to-date map of the world.

We live in a land blessed with plenty—true enough. But the rub is that we will always need hard cash to buy the things we want.

You will need money to make a good down payment on a new home . . . to send the children to college when the time comes . . . or to keep well-supplied with fine food and little luxuries when it comes time to retire.

One of the best ways you can assure yourself that you *will* have the money you need for the things you want later in life is to *salt away some of the money you now earn in U. S. Savings Bonds.*

These Bonds are the safest in the world. And they make money for you. Each \$75 you save today will grow to \$100 in just 10 years.

So start saving now . . . the automatic way, on the Payroll Savings Plan where you work, or buy them regularly through your bank or post office.

**AUTOMATIC SAVING
IS SURE SAVING -
U.S. SAVINGS BONDS**

*Contributed by this magazine in co-operation
with the Magazine Publishers of America as a public service.*



RADIOMEN'S HEADQUARTERS * WORLD WIDE MAIL ORDER SERVICE!

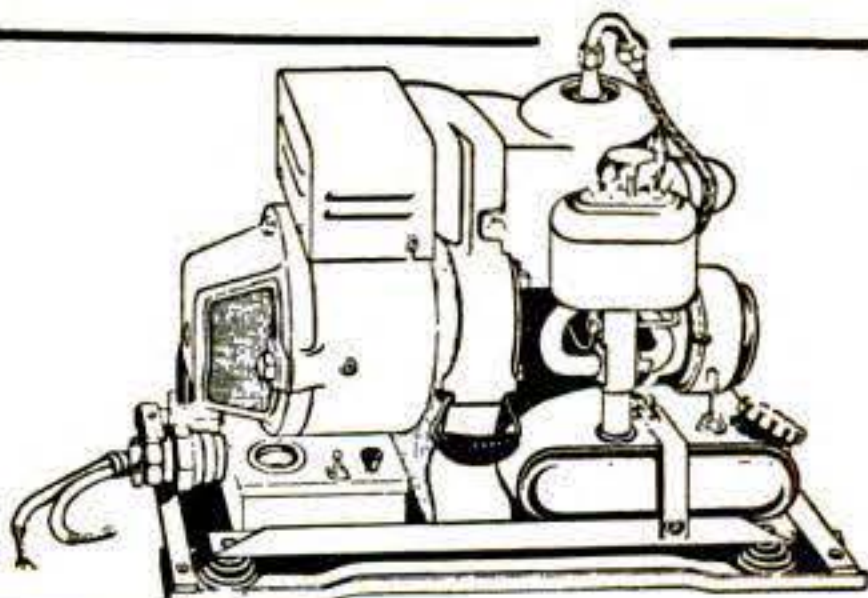


HEAT GUN

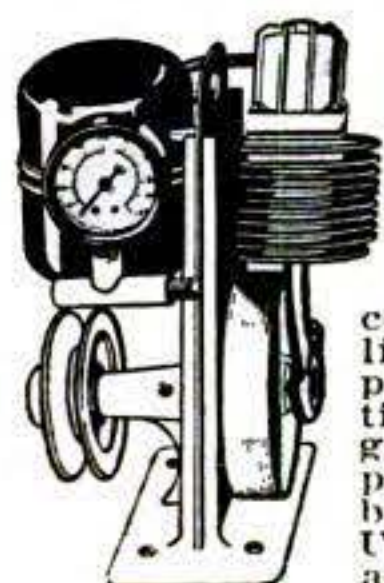
Streamlined pistol grip heat gun in vivid red housing, that delivers a powerful 20 Cubic Ft. per minute blast of hot air at 160° Fahrenheit. Ordinary blowers have small fan motors, but this has a lifetime-lubricated AC-DC motor of the rugged vacuum cleaner type, that produces a hurricane of either hot or cold air. Perfect for blowing out dirt or dust, drying out ignition systems, warming up carburetors, drying paint, thawing out radiators, etc. Warning:—Keep this away from your wife, or she will be using it to dry her hair because it will do it in half the time of her ordinary hair dryer, to say nothing of her using it to dry stockings or clothing, or defrost the refrigerator instantly. Only \$12.95. Satisfaction guaranteed or money refunded if returned prepaid within 5 days.

PE-109 32-VOLT DIRECT CURRENT POWER PLANT

This power plant consists of a gasoline engine that is direct coupled to a 2000 watt 32 volt DC generator. This unit is ideal for use in locations that are not serviced by commercial power or to operate many of the surplus items that require 32 volts DC. The price of this power plant is only \$75.00. We run and test every unit before shipment. We can also supply a converter that will supply 110 V AC from the above unit or any 16-32 V DC source for \$12.95.



COMPRESSED AIR INSTANTLY, Anywhere!!



Portable Air Compressor and storage tank. Ruggedly built of best materials using lifetime lubricated ball-bearing on connecting rod and oil impregnated main bearing on shaft. Unusual design forever eliminates valve trouble, the most common fault in air compressors. **PATENTED** unique air intake system increases efficiency tremendously over other compressors so that air output is much greater than that from larger compressors powered by heavier motors. Will deliver approx. 3500 cu. in. air per min. at maintained pressure of 30 lbs., or will inflate a 90 lb. truck tire in less than 1 min. Complete with 100 lb. gauge, fingertip adjustment allows setting of output pressure at any value, which will automatically be maintained. Works from any 1/4 H.P. motor. Useful for spraying paints or lacquers, disinfectants, insecticides, annealing or brazing with natural gas, inflating tires, etc. Price \$14.50 postage prepaid anywhere in U.S. Efficient, adjustable syphon type spray gun complete with 12 ft. of 100 lb. tested hose for only \$7.75 with pint container, also prepaid. 25% required on C.O.D. orders.

Sensational Value In AC-DC Pocket Tester

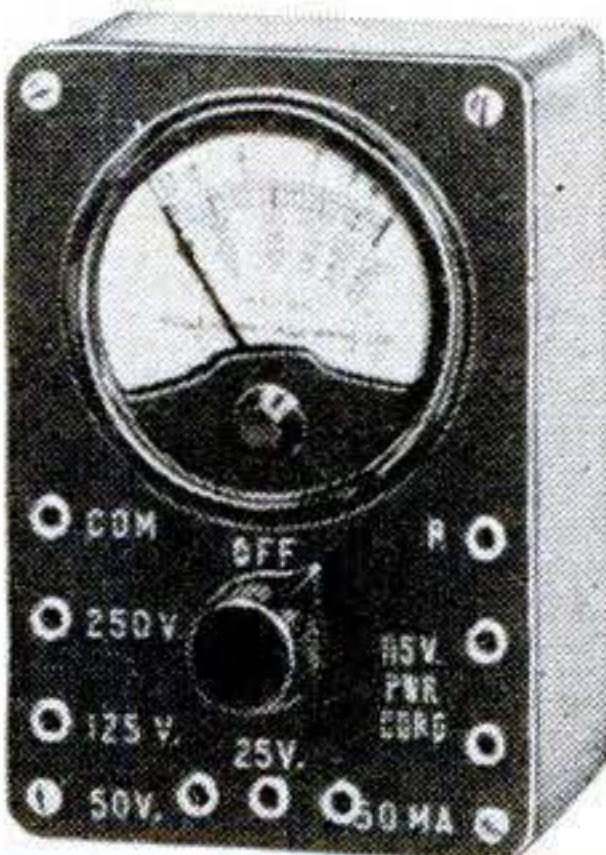
This analyzer, featuring a sensitive repulsion type meter housed in a bakelite case, represents the culmination of 15 years achievement in the instrument field by a large company specializing in electronic test equipment.

Specifications of the AC-DC Model Volt-Ohm-Milliammeter:

AC Volts—0-25,50,125,250
DC Volts—0-25,50,125,250
Milliamperes AC—0 to 50
DC Milliamperes—0 to 50
Ohms Full Scale—100,000
Ohms Center Scale—2400
Capacity—.05 to 15 Mfd.

Total Price, prepaid anywhere in the USA—\$7.00

Similar DC Meter, lacking the AC operated ranges of above, \$5.50 prepaid



RT-1248 INTERCOMMUNICATION TRANSCEIVER

This brand new 15 tube transmitter-receiver was designed for mobile service on 12 volts, and will operate in the "Citizens' Band," where no govt. license to transmit is necessary. It's a cinch for any experimenter to connect this unit for 110 VAC operation by following the instructions and diagrams supplied, which cover numerous applications, including television. For those intending to use on car or boat, a new dynamotor, exactly as originally supplied, costs only \$15.00. Don't fail to write for **FREE** descriptive bulletin. RT 1248 transceivers only \$29.95 each, or two for \$53.90.

RT-1655—11 tube crystal controlled superheterodyne receiver that covers the FM band. The ultra modern circuit uses the latest types of tubes including 7 miniature 6AJ5's. Beautiful chassis and aluminum cabinet. Tubes and schematic supplied.—\$14.95.

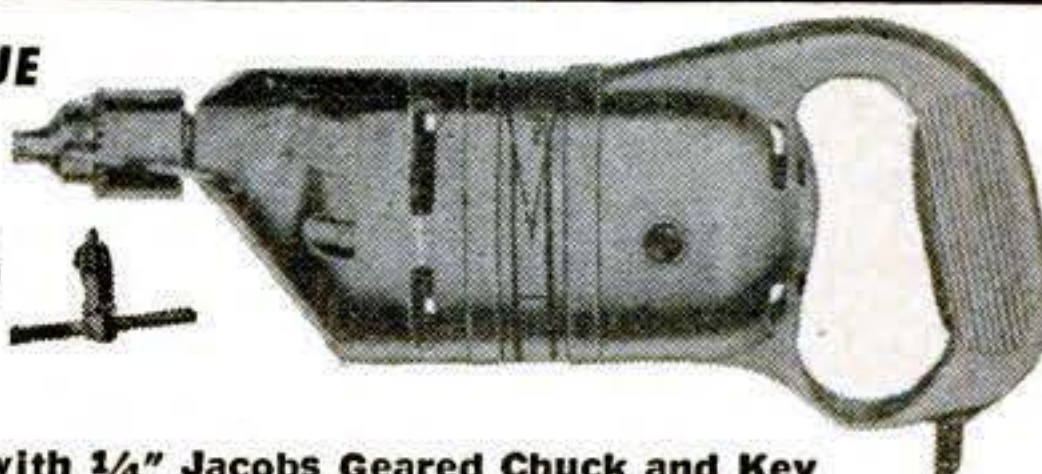
CABLE ADDRESS BUFRAD

Minimum order \$3.00—All prices subject to change—25% deposit with C.O.D. orders.

TERRIFIC VALUE

ONLY

\$20⁹⁵



Equipped with 1/4" Jacobs Geared Chuck and Key
PORTABLE ELECTRIC DRILL
(Sold at less than established factory price so we cannot mention brand name)

Not an intermittent duty drill, but a full size rugged tool. Most convenient type switch, natural grip handle, and balance like a six shooter. Precision cut gears—turbine type cooling blower—extra long brushes. No stalling under heaviest pressure because of powerful 110 Volt AC or DC motor and multiple ball bearing thrust. Other bearings self-aligning lifetime-lubricated Oilite type. Made for toughest year-in and year-out service in plant or on construction jobs. Amazing perpetual factory guarantee assures you of a lifetime of trouble-free use.

Full refund (you pay transportation) if not pleased with drill after trial.

World renowned 700 page tenth edition of the **RADIO HANDBOOK** in cloth binding and hard cover at the sensational reduced price, for a limited time only, **\$1.49**

RADAGER*

*Combination Auto Radio-Battery Charger

Nationally advertised brand 1949 car radio that will fit practically any car. These car radios have plenty of eye appeal plus a host of other features that no other radio regardless of cost can offer.

Built in battery charger that will charge a car battery. The unique circuit of this radio steps up the 6 v input to 110v, that is available in a convenient outlet, for operation of an electric shaver or similar electrical appliance.

The radio is a powerful 6 tube superheterodyne that has a three gang condenser and a stage of radio frequency amplification for increased sensitivity. The radio, complete with built in battery charger and power outlet, is a single compact unit that is easily installed. **Sample—\$39.95; Dealer price, \$37.47** each in lots of two or more.

BUFFALO RADIO SUPPLY

219-221 Genesee Street
Buffalo 3, New York

PS

Please send 1949 Bargain Catalog

Name.....

Address.....

City.....Zone.....State.....

BUFFALO RADIO SUPPLY, 219-221 Genesee St., Dept. PS BUFFALO 3, N. Y.

IT'S NEW THE PUTTY MASTER PLACES GLAZIERS SKILL IN YOUR HANDS



IT'S EASY

A putty knife with the patented shaper that anyone can operate—packs, shapes and trims putty perfectly with one stroke and allows only the right amount of putty to be applied—a time and money saving item that will more than pay for itself.

Only \$1.00 Postpaid
anywhere in the United States.

I am enclosing \$1.00—please send me one Duo-Fast Putty Master.

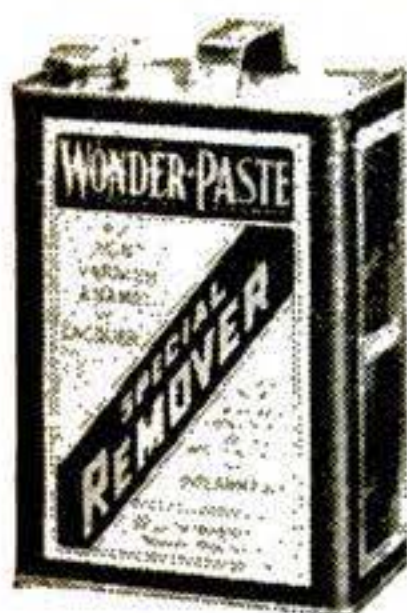
PUTTY MASTER
876 Fletcher Street, Chicago 14, Illinois

Name _____

Address _____

City and State _____

**PAINT
COMES OFF**
without hard scraping!



Cracked or peeling paint, varnish, enamel, shellac, or lacquer must be removed before the surface can be refinished properly. Wonder-Paste Remover makes this job easy. Simply apply Wonder-Paste with a paint brush directly over the old finish. It will not run! When penetration is complete, the old finish is reduced to a soft sludge that slides off like wet snow.

Write for Literature

We'll be glad to advise you on your particular removing problem, and to send you literature on Wonder-Paste . . . At paint and hardware stores.

WONDER-PASTE

Wilson-Imperial Company, 121 Chestnut Street, Newark 5, N. J.



WindoStep*

FOR ALL OUTSIDE WINDOW WORK
... UPSTAIRS OR DOWN

Light, strong, easily handled and adjusted. 500-lb. test. Steel railing, substantial floor, rubber house protectors. Guaranteed. Pat. Pend. Territories open. Free folder. *T.M.

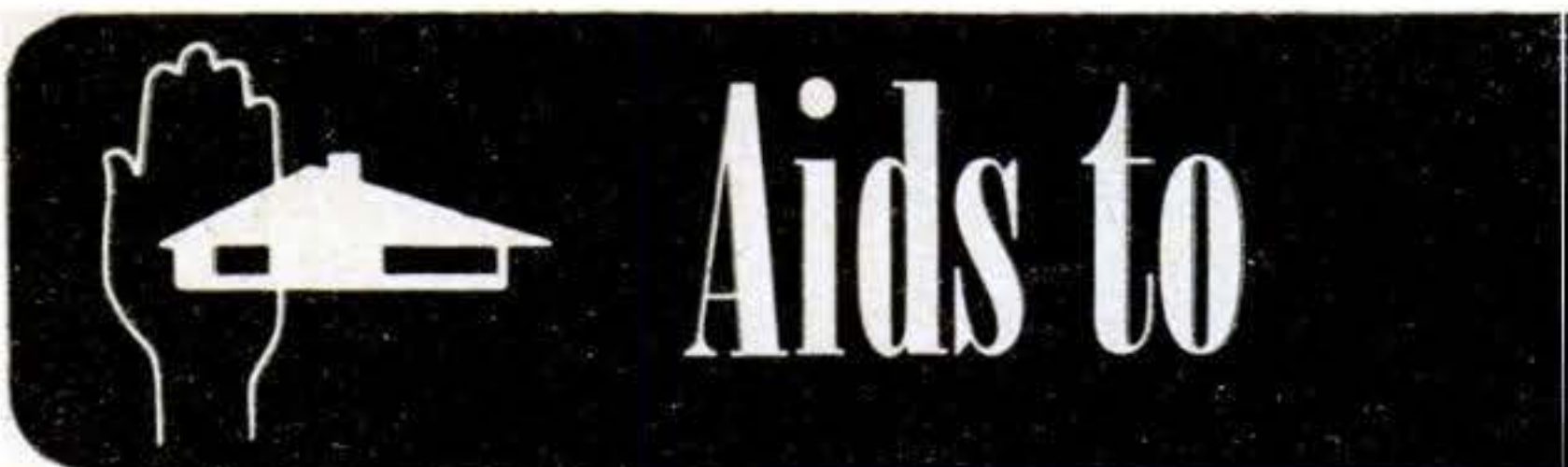
\$9.85 C. O. D. PLUS FEE

\$10.50 POSTPAID

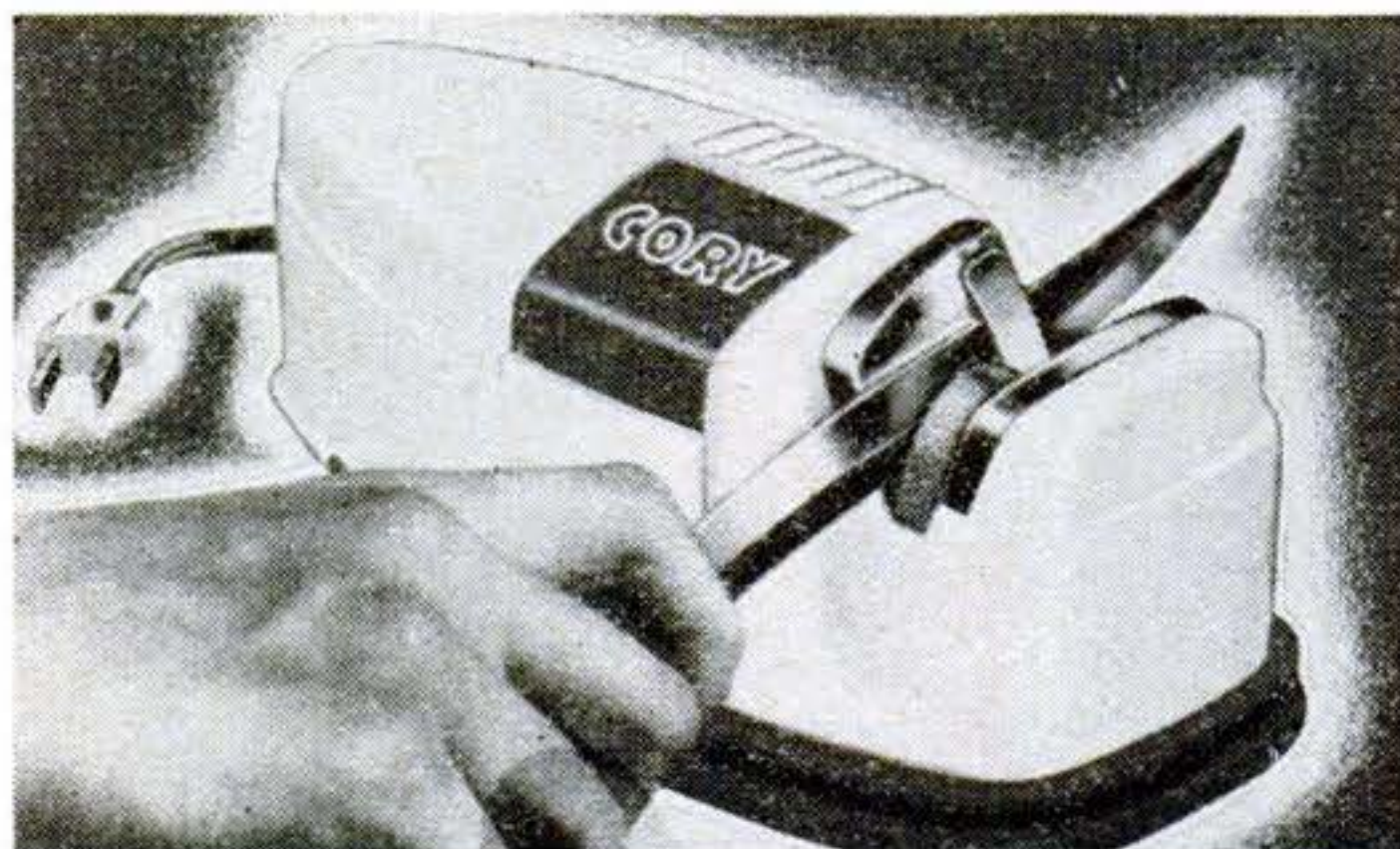
(Add \$.50 West of Rockies)

MORRISON CRAFTERS, Inc.

703 Miami St., Toledo 5, Ohio

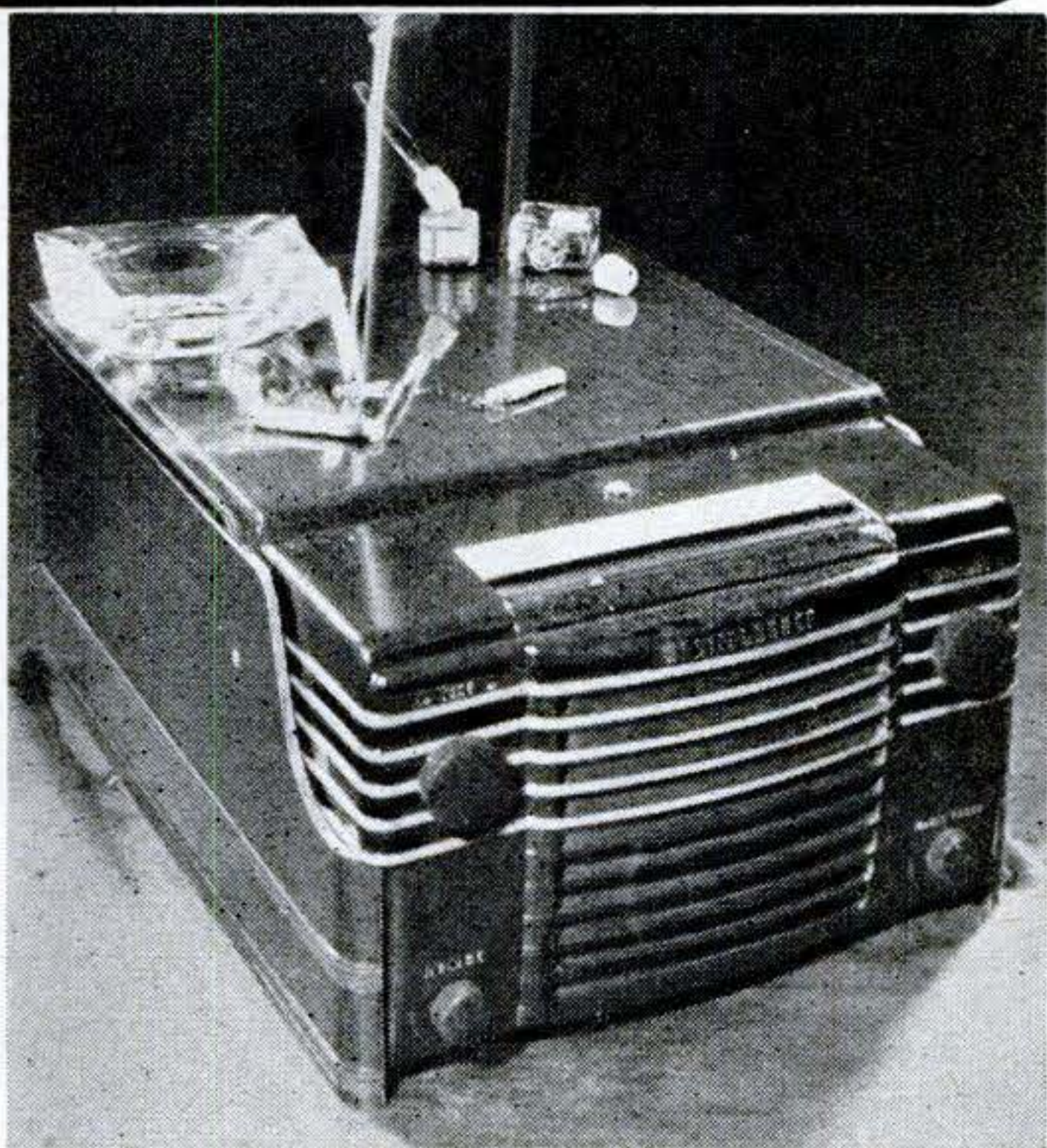


Electric Washers Fit Tubs. Two portable laundry-tub washing machines now are available. Tub-O-Wash[®], above, clamps on a tub. Made by Victor Electric Products, Inc., Cincinnati, Ohio, it's priced about \$45. Metro Washer[®], which sits in the tub, is made by Metropole Machine Corp., Long Island City, N. Y. About \$60.

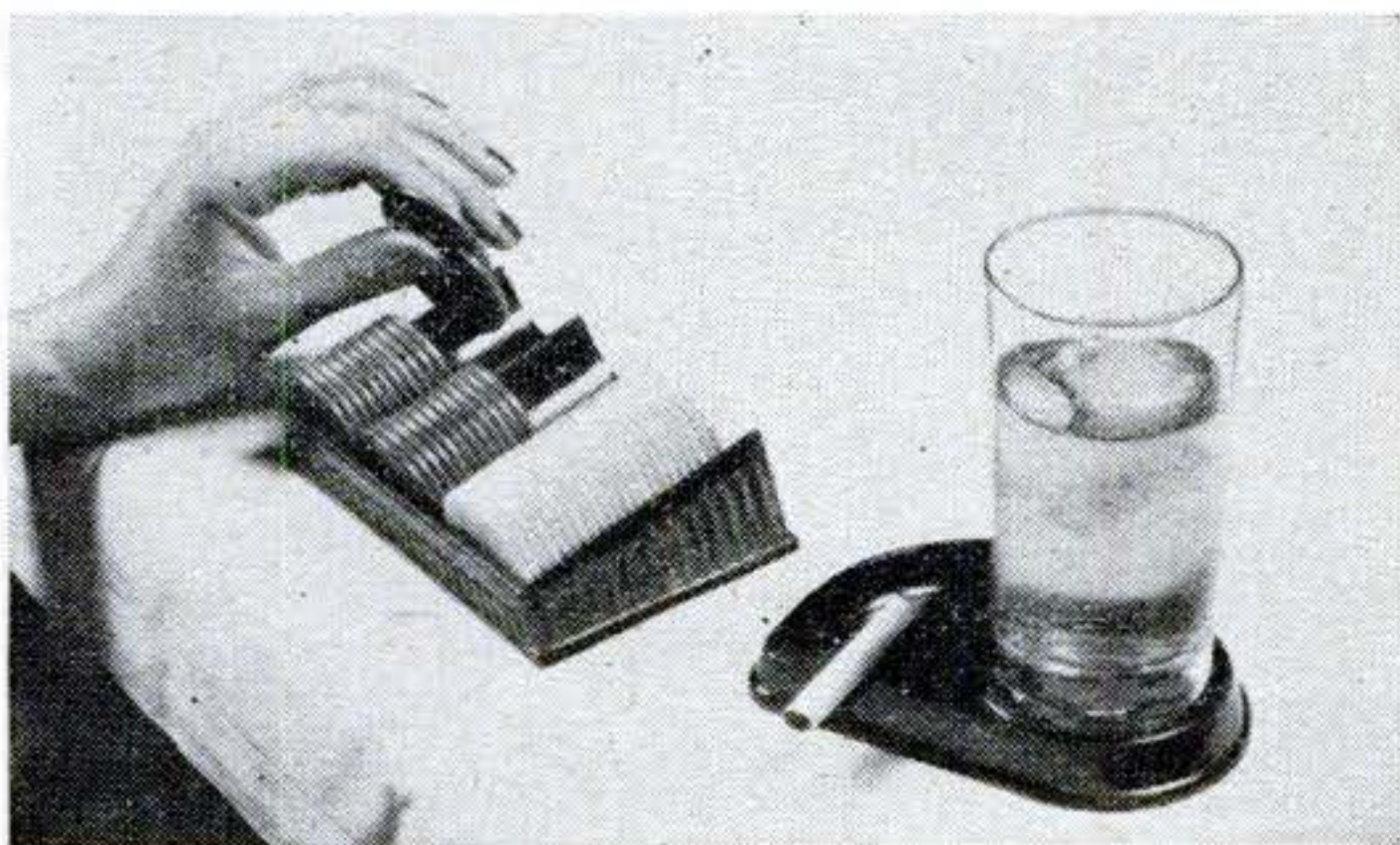


Motor Drives Home Sharpener. In this kitchen aid, a 115-volt AC motor spins an abrasive wheel at 3500 r.p.m. You draw knives through clips that hold them at the correct angle for sharpening. Weighing 3¾ lb., the device measures 3½" by 3½" by 8½", sells for about \$12, and is made by the Cory Corp., Chicago.

Modern Living

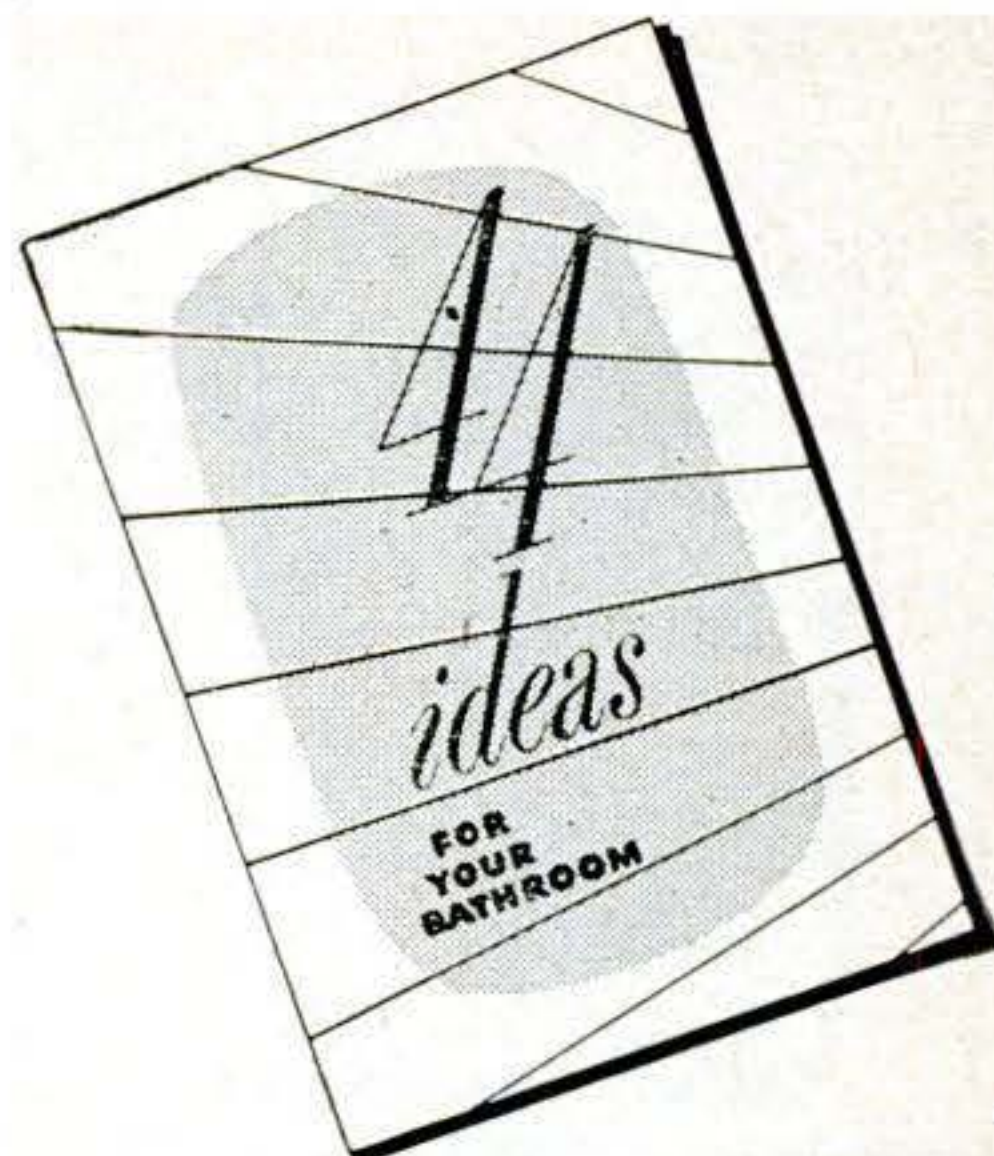


Nonmarring Radio Cabinet. Cigarettes burn out on this cabinet without leaving a mark, while finish-scarring liquids such as alcohol, salt water, or citric acid do not harm it. The manufacturer adds that the cabinet will not warp, splinter, or crack. The mahogany-like synthetic is Micarta[®], a Westinghouse phenolic laminate recently applied to radios by the company's Home Radio Division.



Rack Holds Chips. These playing-chip racks keep the card table orderly and are complemented by matching combination coaster-ash trays that hold a drink and a cigarette. The Sutone Company, of Hollywood, Calif., makes both pieces in a brown or black plastic that is burnproof and unaffected by hot water.

44 new ideas for your bathroom!



Here's the grand new *illustrated* booklet that shows you *how* to plan the perfect bathroom for your new home . . . or how to lend new charm and utility to your present bathroom!



Its smart *new* ideas are based on more than 25 years of leading the way with modern improvements in bathroom cabinet design, convenience and construction! Mirrors, crystal glass shelves, towel racks, accessories . . . see how to arrange them perfectly!



Let your bathroom reflect your own individuality and good taste. This booklet is full of wonderful suggestions!



mail this coupon today!

MIAMI

Carey

Miami Cabinet Division
The Philip Carey Mfg. Company
Cincinnati 15, Ohio

I am enclosing 10c. Please send me the booklet, "44 Ideas For Your Bathroom."

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

NOVEMBER 1948 319

T
H
E

P
E
R
F
E
C
T



SO-EASY
CAR WASHER
\$3.95 Direct from Factory
PAT. PEND. POST PAID

Make your car sparkle, easily and quickly, by using our light weight washer—45" long. No fuss or getting wet. Great for women. W. S. Minneapolis writes "I paid twice your cost for one, but it's too clumsy. I much prefer yours, it's really so easy."

- Hygrade, soft, durable mop proven best and also for hard-to-get-at places. Will not scratch.
- Holds more water for soap and pail use.
- Rubber grips insulate hands from cold tube.
- Sliding grip meets all working positions.
- No back pressure—prolongs hose life.
- Coil spring fits in your hose—Prevents kinking.

We Guarantee Satisfaction. No C.O.D.'s please.
KEELCRAFT, HOPATCONG 3, N. J.

X
M
A
S

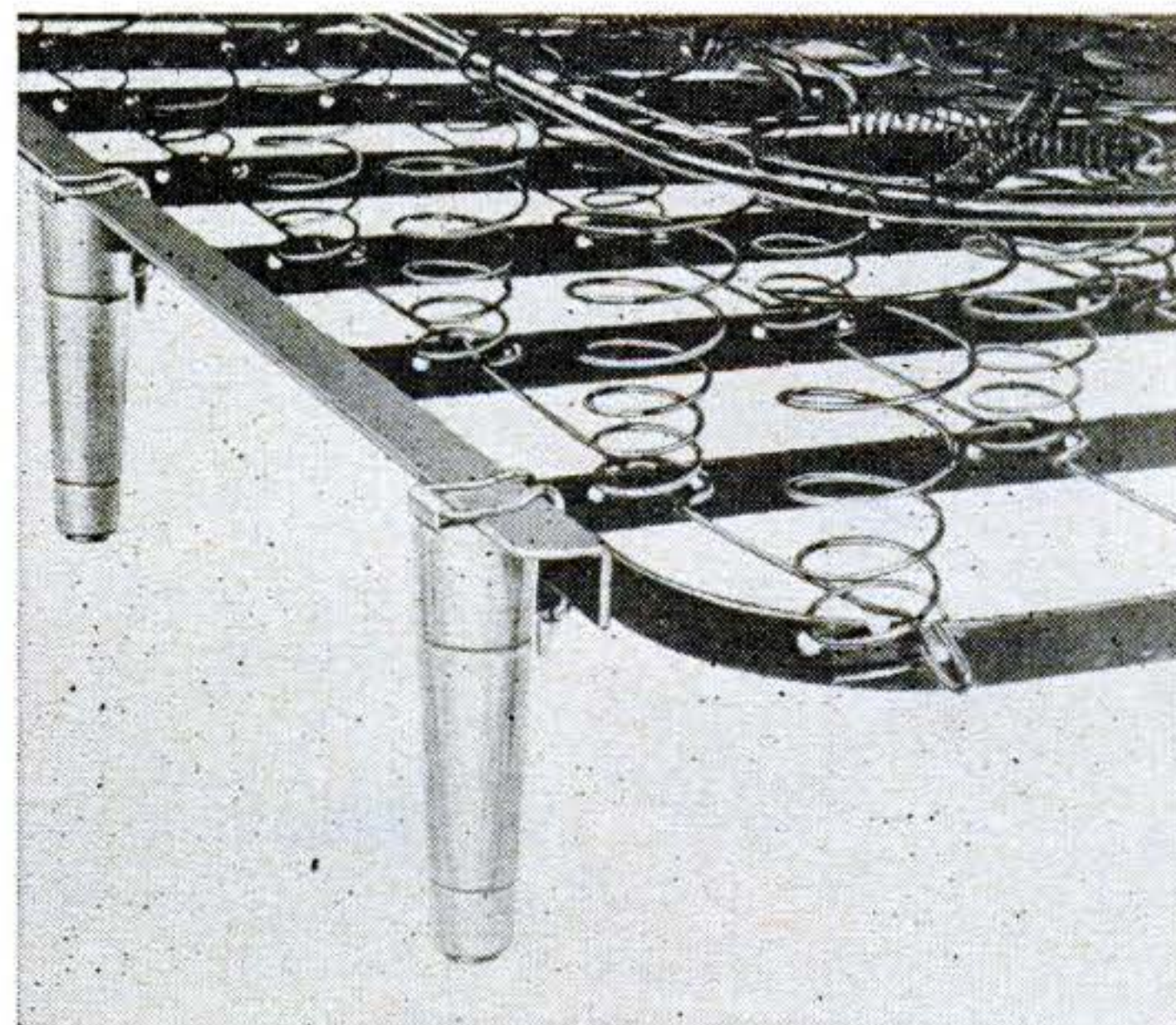
P
R
E
S
E
N
T

Aids to Modern Living



Plastic Screens Baby Carriage.

Designed for comfort in either hot or cold weather, this baby coach by Thayer, Inc., New York, N. Y., has plastic side screens that may be covered with snap flaps. The flexible mesh does not rust, corrode, or fade and may be cleaned with a damp cloth. Price is about \$45.



Bed Legs Snap On. Coil springs become a bed in a jiffy when six hardwood legs are snapped to the iron frame. Made by Colson Bros., of Los Angeles, the legs stand 7" high and are held in place by heavy wire clips. The two center legs stand on nonskid rubber feet; the others rest on metal gliders. Price: \$5.95.

MANUFACTURER'S SURPLUS

ONLY

SAVE! 1/2 Price
A REAL STEAM ENGINE

\$13.50
Postpaid



ENGINE: Double acting, oscillating type—Cast Brass and Aluminum—Stainless steel connecting rod and drive shaft. Two-step pulley for speed change. Develops 1/30-H.P. at 1000 R.P.M. Made to engineering standards.

BOILER: 18-gauge. Seamless Drawn Brass. Whistle safety valve, throttle, water gauge. 475-watt heating element generates sufficient

power to do REAL job operating models, toys, gadgets. Engine and Boiler mounted on heavy metal base. Size: 6" x 9" x 11" high, 7 pound weight. GUARANTEED SAFE.

SEND NO MONEY. Write your order on a post card; we ship C.O.D. (you pay postage and small C.O.D. charge). SEND \$13.50 check or money order, sent Post Paid.

DO IT NOW . . . THEY WON'T LAST LONG!

DE KAY MACHINE PRODUCTS CO.

Dept. A-1172 South La Brea Ave., Los Angeles, Calif

Saves HOURS OF TOIL



YOUR MOST PRACTICAL GIFT

Attach TRIMIT to a 1/4" electric drill and you have a power-driven clipper that whizzes through hedges, weeds, etc. Perfect for edging flower beds, walks. Simple, one screw assembly. Costs only \$9.95. Combination set of TRIMIT and 1/4" B. & D. drill only \$27.95. Send check, money order, or C.O.D. order. Card enclosed if sent as gift.

ONLY
\$9.95

WOODLAND PRODUCTS CO.
PITTSBURGH 15, PENNSYLVANIA

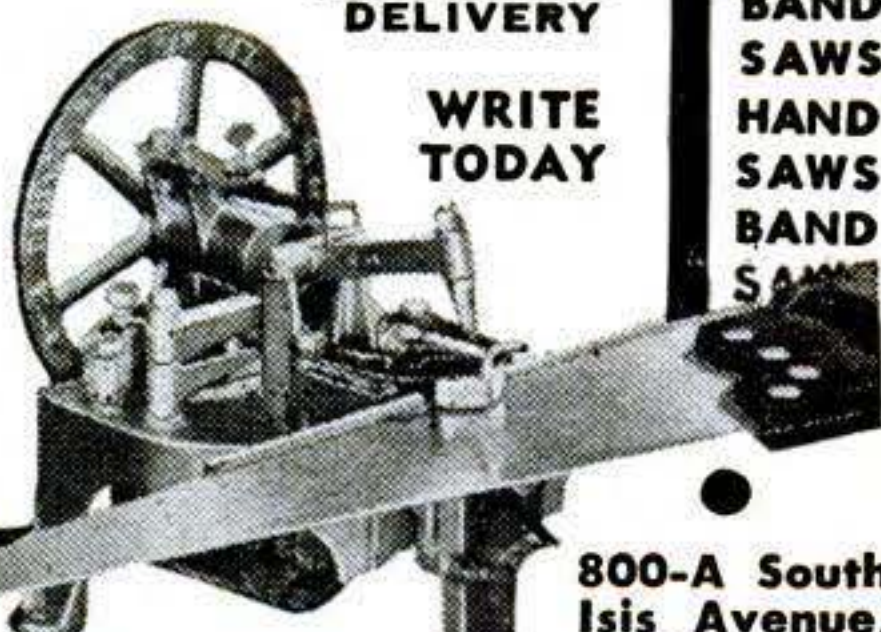
EXTRA PROFITS FOR SAW SHOPS WITH BEMACo RAPID SAW SET

IT'S AUTOMATIC

Sets hand saw teeth in 60 seconds—Approx. 400 band saw teeth. 4 1/2 to 12 points with one adjustment. Hammer and anvil action does precision job. Every tooth alike—no breakage.

IMMEDIATE DELIVERY

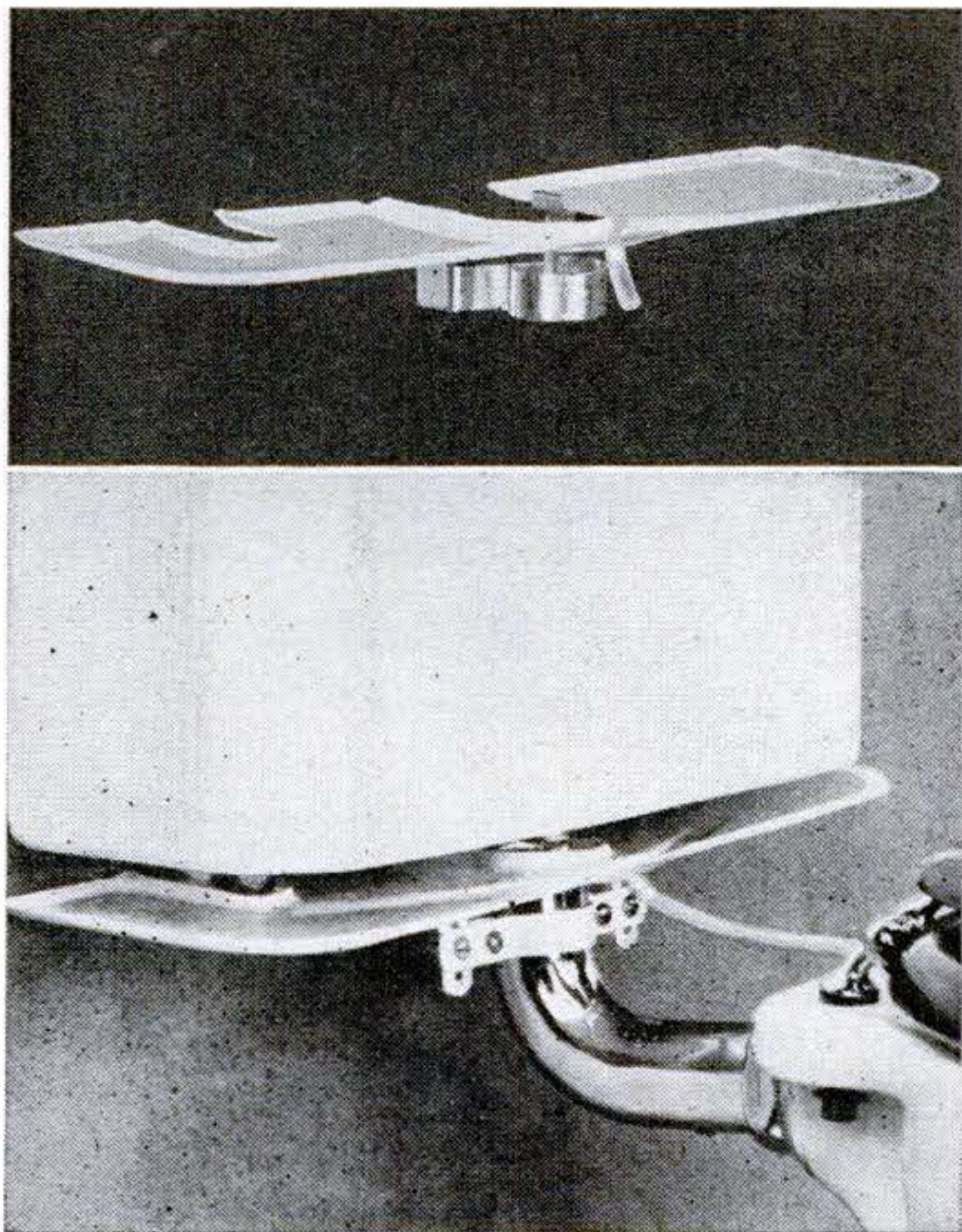
WRITE TODAY



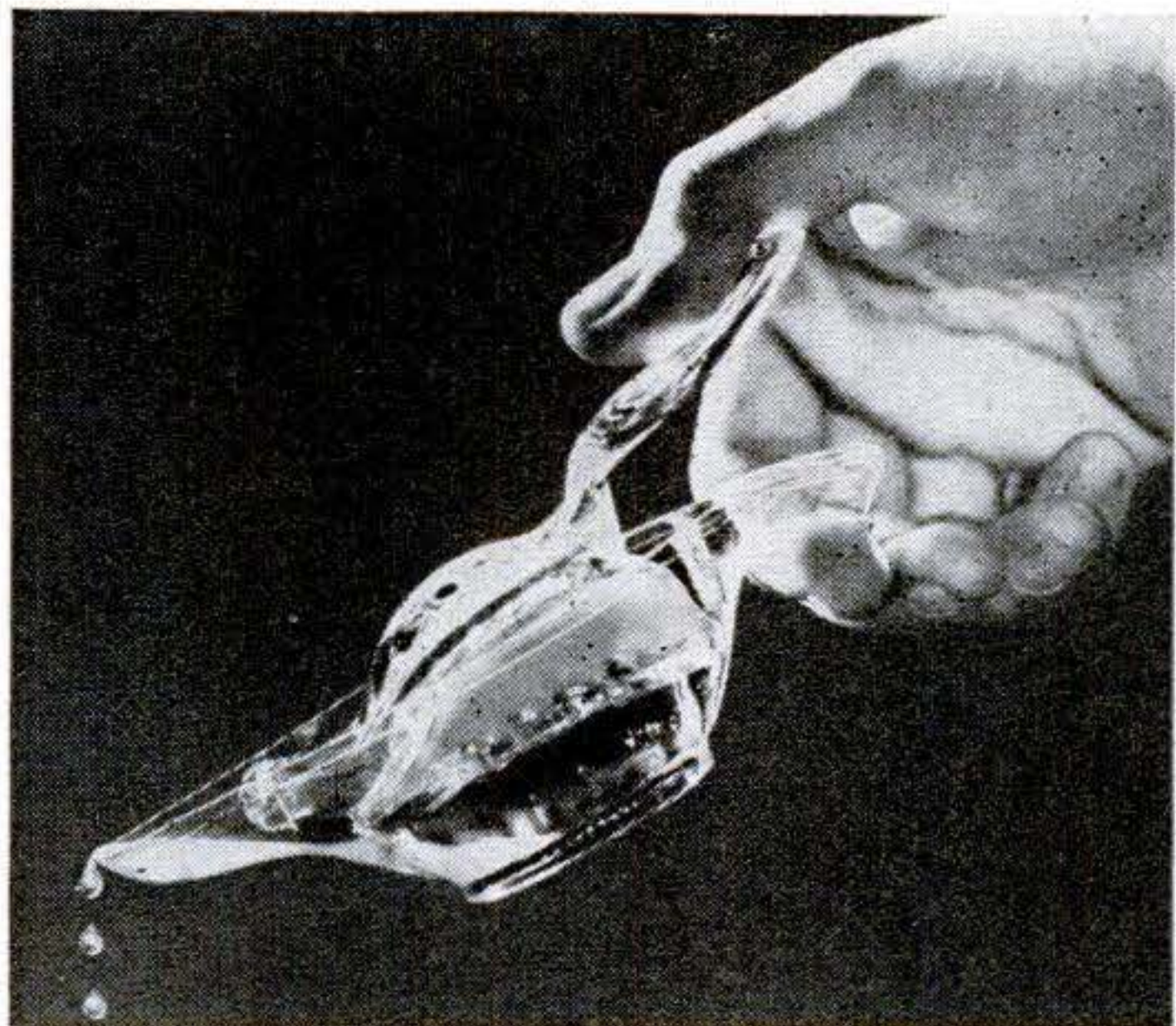
800-A South
Isis Avenue,
Inglewood,
California

BEAVER MFG. CO.

HAND
SAWS
BAND
SAWS
HAND
SAWS
BAND
SAWS
HAND
SAWS
BAND
SAWS



Tray Catches Stray Drips. Damage or discoloration of bathroom floors is avoided with the aluminum Drip Not® tray that clamps under a toilet tank. The moisture that condenses on the cold tank surface is piped directly into the bowl through a small hose. Laufenberg, Inc., of Milwaukee, Wis., is the maker.

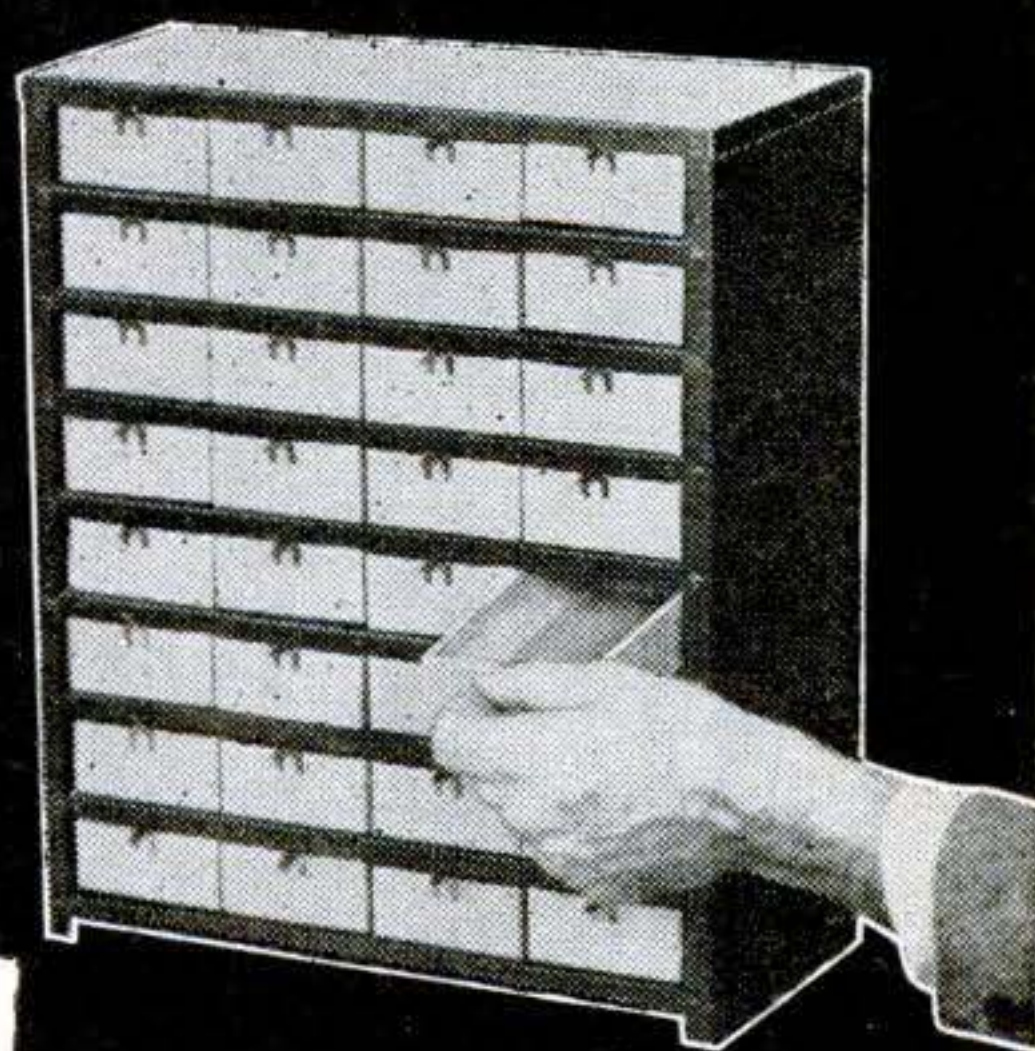


Squeezes and Pours Juice. Made of clear plastic, this little combination juicer, strainer, and server gives you just the amount of lemon juice you want. As the top and bottom handles are brought together, a lemon quarter is squeezed and strained. The gadget is offered by Crystalier Co., of New York, N. Y., at \$1.25.

NOW

**THE JIFFY METAL CABINET
WITH RUSTPROOF ALUMINUM DRAWERS**

**32
DRAWER
UNIT
\$8.95
POSTAGE PAID
64
DRAWER
UNIT
\$15.95**



**APPROXIMATE
SIZES
DRAWER**
1 1/4" Deep
2 3/4" Wide
6" Long

32 DRAWER UNIT
6" Deep
12 3/4" Wide
15 1/4" High

64 DRAWER UNIT
6" Deep
25 1/2" Wide
15 1/4" High

for home or shop,
the handy way to
keep small parts,
washers, nuts, bolts,
nails, screws, etc.

**AND
STILL
AVAILABLE**

**32
DRAWER
UNIT
\$5.95
POSTAGE PAID
64
DRAWER
UNIT
\$9.95**

Solid one-piece aluminum drawers for greater strength and long life—and still at low cost. So handy to keep office, shop, work bench, household and hobbyist needs at your fingertips. Spot welded steel cabinet, enamel finish, and metal flange drawer guides.

32-Drawer Unit — \$8.95. 64-Drawer Unit — \$15.95. Postage Paid. Send check or money order. No C. O. D.'s, please. Add 3% sales tax for Ohio orders.

**THE JIFFY METAL CABINET
WITH LAMINATED FIBREBOARD DRAWERS**

Same steel cabinet as above with covered fibreboard drawers. Suitable for most home needs. Thousands in use. 32-Drawer unit — \$5.95. 64-Drawer unit — \$9.95. Postage Paid. Check or money order. No C.O.D.'s. Add 3% sales tax for Ohio orders.

KAYTEE PRODUCTS
DEPT S • BOX 588 • CANTON, OHIO

TO: *Reader*
FROM: *Editor*

Hard Job Well Done



Herbert Yahraes

WRITING about science looks easy when it's done well. A lot of scientists, teachers, newspapermen, and enthusiastic amateurs try it every day. Most of them find that it is much harder work than they had thought. Very few do it well.

That's why the same person's by-line is likely to appear not once but many times in POPULAR SCIENCE. When we find a fellow who really makes the concepts, difficulties, and achievements of scientists easy for you to understand, we encourage him to keep on producing such articles for you.

One of those fellows is Herbert Yahraes, whose name you may also have noticed in *The Saturday Evening Post*, *The Woman's Home Companion*, *Liberty*, *The American Mercury*, or some other magazine. He is a 43-year-old former newspaperman who lives in a cavernous old house four miles from the Stanfordville, N. Y., grocery store.

Yahraes served a long apprenticeship on *The Associated Press*, *The New Orleans Item and Tribune*, and several other newspapers before becoming a full-time magazine writer. He has written so much about medical matters for so many magazines in the last few years that he frequently receives mail addressed to "Dr. Yahraes." But he doesn't enjoy writing about medicine. "Every time I tackle a disease," he explains, "I get the symptoms. After writing a pamphlet on alcoholism, I couldn't even touch beer for three months."

Such reactions made life so dismal for Herb that he welcomed our suggestion a couple of years ago that he try doing some stories for POPULAR SCIENCE. The first one was about liquid helium. It was an ex-

tremely difficult assignment. He had to go back and interview a Yale physicist three times before he finished the article. But he felt so good afterwards that we succeeded in talking him into writing several more articles for us.

One of them, called "Static from the Stars," appeared last January. It was the only article given honorable mention in the competition this year for the \$1,000 prize awarded by the Westinghouse Educational Foundation to the writer of the best science article in a magazine. And, says Yahraes, "of all my writing as a free lance, that was the story I enjoyed doing most."

The winner of the Westinghouse prize was Dr. Florence Moog, an assistant professor at Washington University in St. Louis. She wrote about "The Biology of Old Age" for the *Scientific American*. It was such an interesting article that we wished, when we read it, that we had had it in POPULAR SCIENCE.

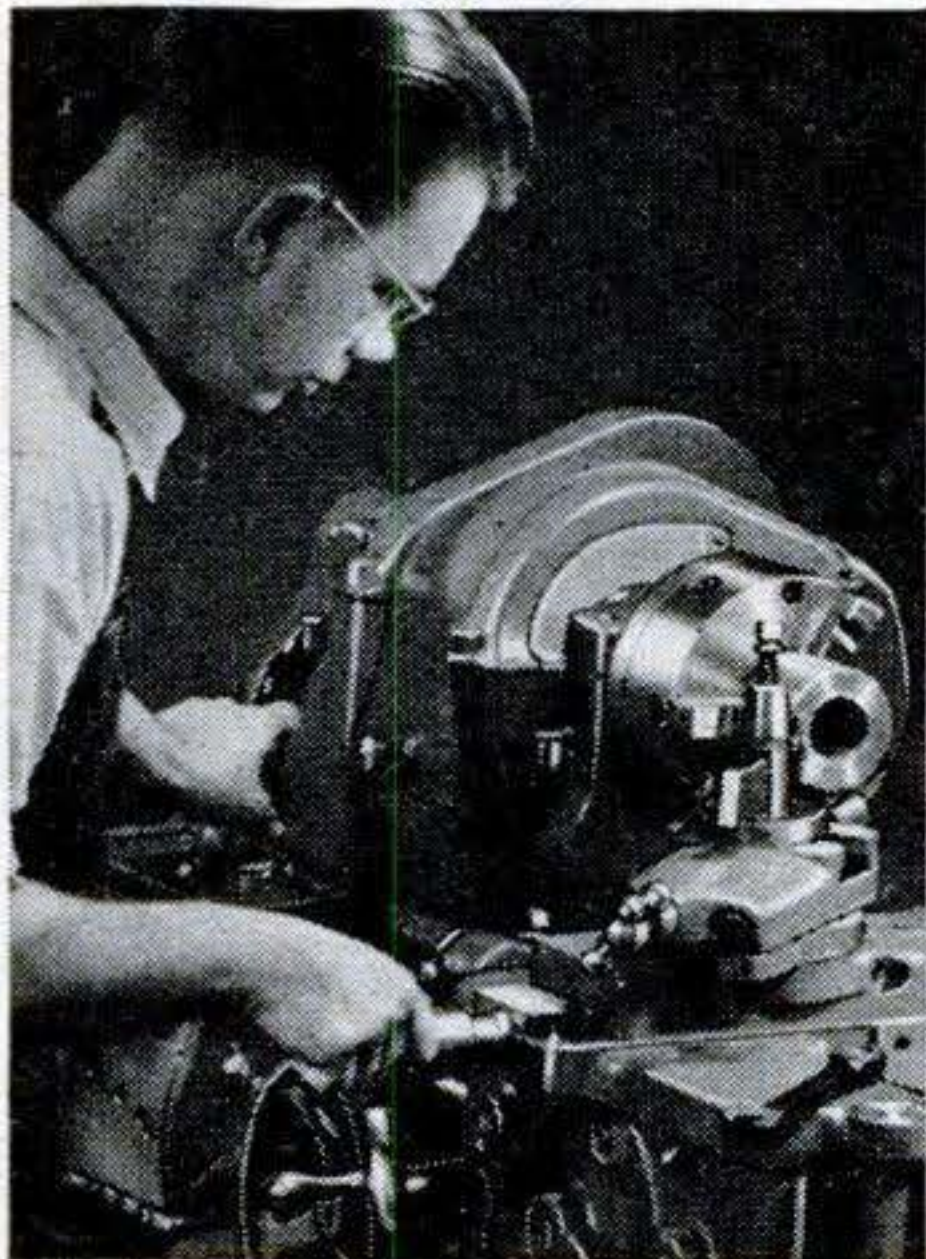
Another \$1,000 prize was given by the Westinghouse foundation to the writer of the best science story in a newspaper—and that was won by Frank Carey of *The Associated Press*. We were pretty happy about this because Carey also has done some writing for us. He was the author of the piece called "Don't Try to Crash This Gate" about security precautions at the Atomic Energy Commission's headquarters, which appeared in POPULAR SCIENCE last February.

Volta Torrey

SOUTH BEND

Precision

MACHINE TOOLS



NEW 13" & 14½"—1" COLLET LATHES

The 13" and 14½" swing South Bend Lathes are now available with larger headstock spindles having 1⅜" bore, which permits using the No. 5 South Bend Collet which has 1" maximum capacity. Except for the increased capacity through the spindle and collet, these lathes are the same as the regular 13" and 14½" lathes shown on the following pages.

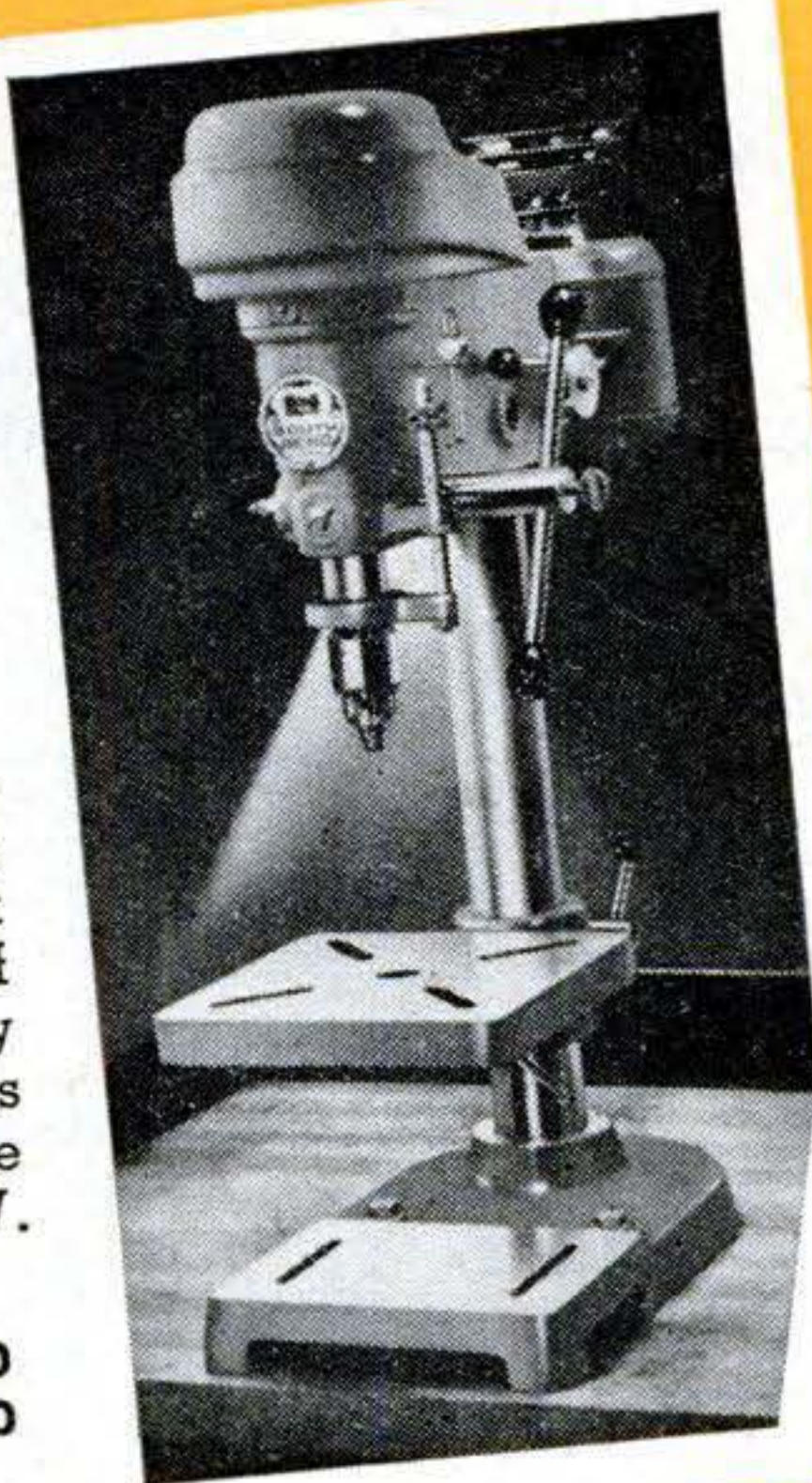
Prices include 3 ph. motor and control.

Lgth. of Bed Feet	13"—1" Collet Lathes				14½"—1" Collet Lathes			
	Quick Change		Toolroom		Quick Change		Toolroom	
	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
4	145-A	\$1294.25	.....	.....	.....	.....	.....	.....
5	145-B	1332.25	8145-B	\$1694.25	185-B	\$1581.25	8185-B	\$1963.25
6	145-C	1370.25	8145-C	1734.25	185-C	1621.25	8185-C	2008.25
7	145-D	1408.25	8145-D	1774.25	185-D	1661.25	8185-D	2053.25
8	.....	.....	.....	.....	185-E	1701.25	8185-E	2098.25

NEW 14 INCH DRILL PRESS

A ruggedly built tool unsurpassed for accuracy, ease of operation and dependable performance. Features free-floating spindle, precision ball bearings, quick-acting belt tension release, etc. Has built-in light for illumination of work. Drill capacity is ½" in steel. Prices include ⅓ h.p. single ph., 60 cycle, 115 V. motor and switch.

Bench Model..\$129.30
Floor Model... 144.30



NEW 7" BENCH SHAPER

The South Bend 7" Precision Bench Shaper has been developed to meet toolroom and industrial demands for an accurate, compact bench shaper that is precision engineered and sturdily constructed.

Ram has 0" to 7" stroke. Tool head has 3" feed and swivel clapper box. Table is 5⅞" x 5" x 6" deep, has 13" horizontal travel, 5" vertical travel. Has power cross feed. Vise opens to 4" and has graduated swivel base.

Prices Quoted
on Request.



All prices in this catalog are net f.o.b.
factory unless otherwise stated



SOUTH BEND LATHE WORKS

BUILDING BETTER TOOLS SINCE 1906

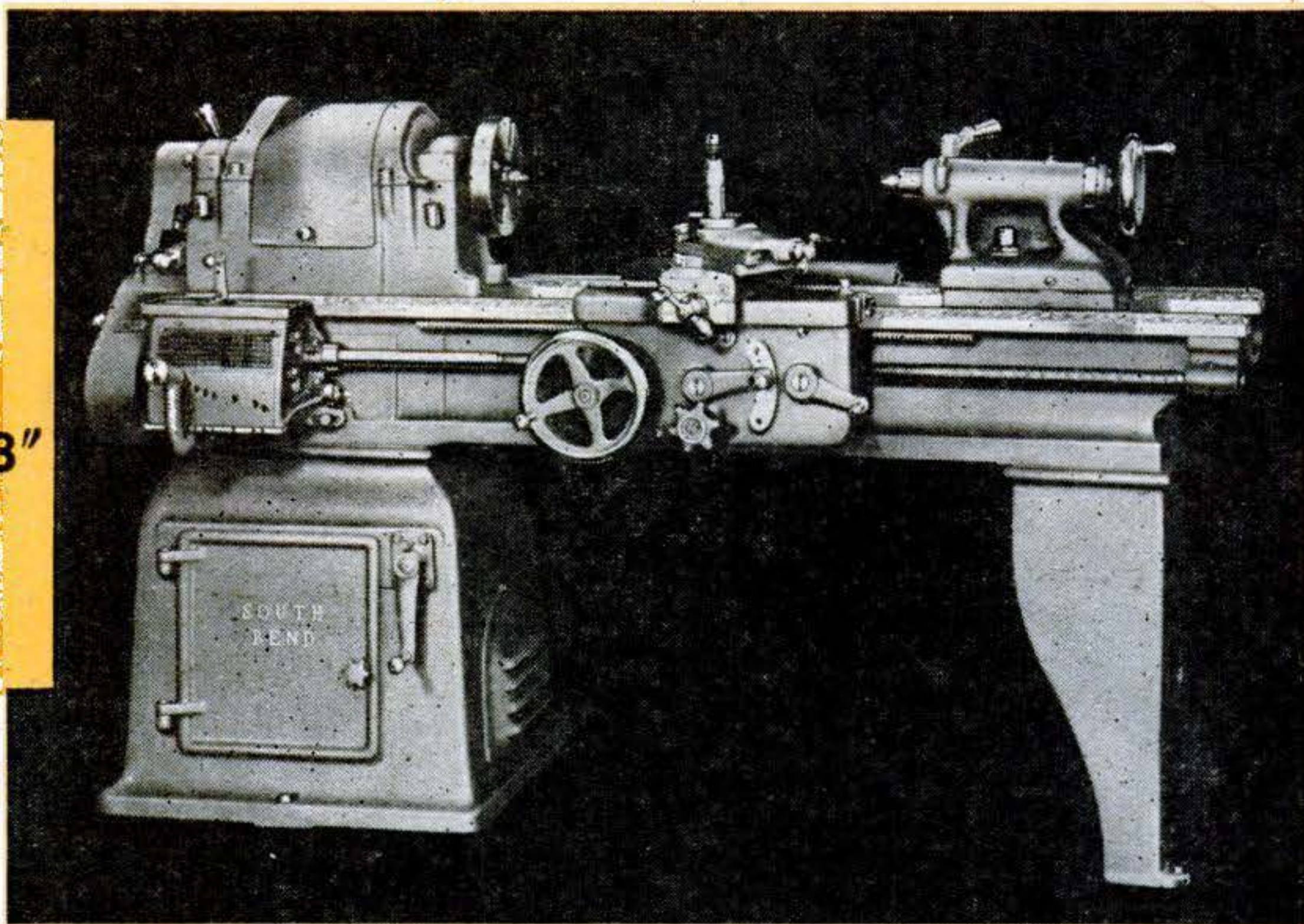
524 EAST MADISON STREET, SOUTH BEND 22, INDIANA., U.S.A.

SOUTH BEND

16", 14½", and 13" Quick Change Gear Lathes

South Bend 16" x 6' Quick Change Gear Lathe

\$1729.25



SPECIFICATIONS	16-INCH	14½-INCH	13-INCH
Swing over bed and saddle wings.....	16¼"	14⅝"	13⅞"
Swing over saddle, chip guard removed	11⅞"	10¼"	8¾"
Swing over saddle with chip guard....	9⅝"	8¾"	7¾"
Spindle speeds.....	26 to 885 r.p.m.	27 to 800 r.p.m.	34 to 875 r.p.m.
Thread cutting range.....	4 to 224 R.H. or L.H.	4 to 224 R.H. or L.H.	4 to 224 R.H. or L.H.
Power longitudinal feeds.....	.0015" to .0841"	.0015" to .0841"	.0015" to .0841"
Power cross-feeds.....	.0006" to .0312"	.0006" to .0312"	.0006" to .0312"
Hole thru spindle.....	1⅜"	1⅞"	1"
Collet capacity.....	1"	¾"	11/16"
Spindle centers.....	No. 3 Morse Taper	No. 3 Morse Taper	No. 3 Morse Taper
Size motor.....	1½ h.p.	1½ h.p.	1 h.p.

South Bend Quick Change Gear Lathes are equally efficient on precision toolroom work or close tolerance manufacturing operations. Hundreds of nationally known manufacturers select them when streamlining their shop equipment to meet present day needs. Substantial savings in capital investment, power consumption, floor space, and labor costs have resulted from their installation. They will give you the same efficient service.

The Underneath Motor Drive provides an unusually wide range of spindle speeds. The belt drive to the spindle is silent in operation and develops smooth, steady power entirely free from gear vibration.

Price includes 3 ph., 60 cy., 220 v. A.C. motor and drum control, and regular lathe equipment such as belts, centers, face plates, tool post, etc. Chucks and tools are extra. See following pages.

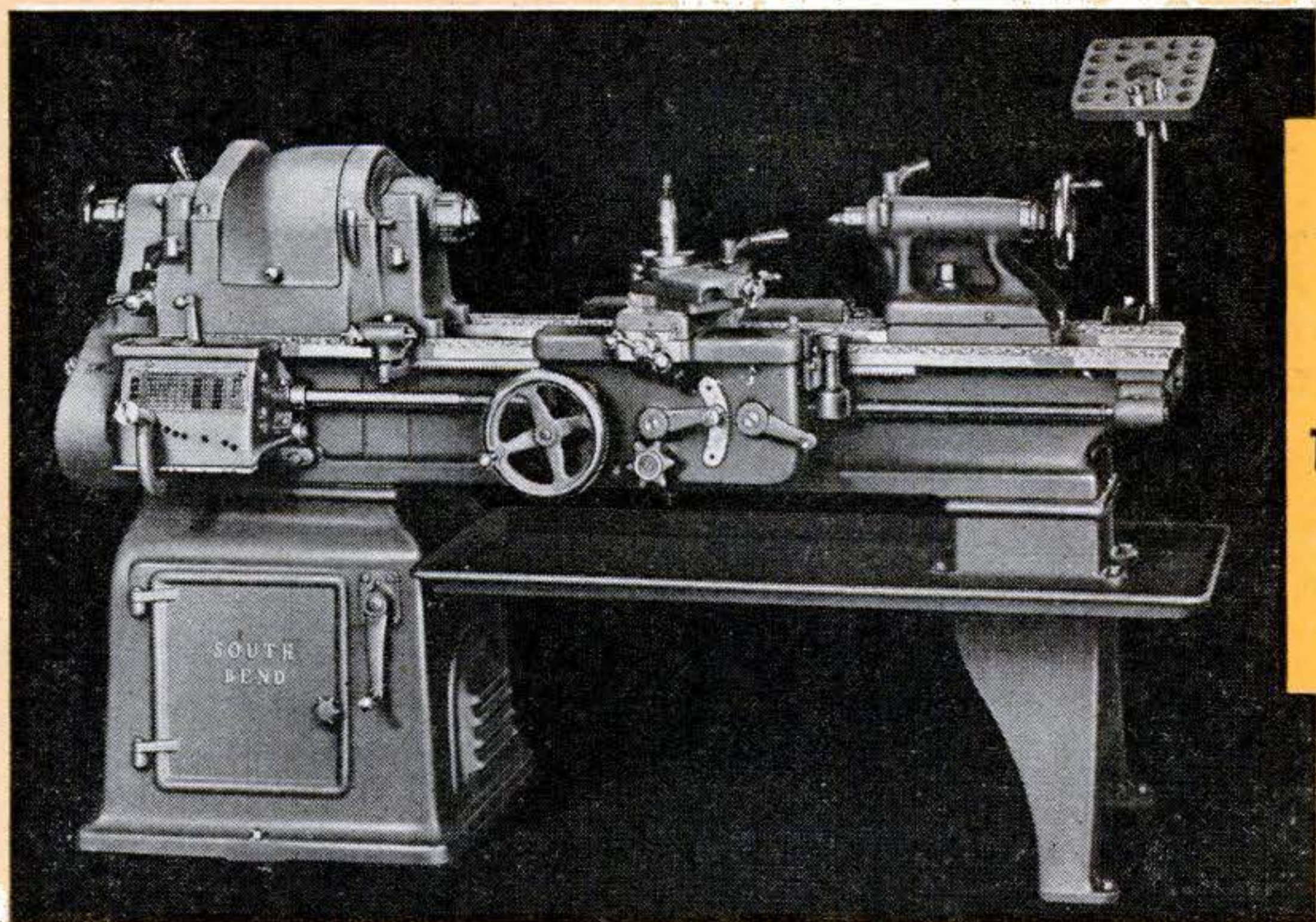
TIME PAYMENT TERMS

25% down, balance 12 mos., moderate finance charge (unless federal law requires otherwise)

Quick Change Gear Underneath Motor Driven Lathes

Catalog Number	Swing Over Bed Inches	Length of Bed Feet	Distance Between Centers Inches	Approx. Shipping Weight Pounds	Price f.o.b. Factory
16" QUICK CHANGE GEAR LATHES					
117-C	16¼	6	33½	2300	\$1729.25
117-D	16¼	7	45½	2380	1769.25
117-E	16¼	8	57½	2460	1809.25
117-G	16¼	10	81½	2620	1924.25
117-H	16¼	12	105½	2850	2039.25
14½" QUICK CHANGE GEAR LATHES					
183-B	14⅝	5	24½	1995	\$1466.25
183-C	14⅝	6	36½	2070	1506.25
183-D	14⅝	7	48½	2145	1546.25
183-E	14⅝	8	60½	2225	1586.25
13" QUICK CHANGE GEAR LATHES					
113-A	13⅞	4	16	1460	\$1189.25
113-B	13⅞	5	28	1510	1227.25
113-C	13⅞	6	40	1560	1265.25
113-D	13⅞	7	52	1615	1303.25

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.



**SOUTH
BEND**
16", 14½", and 13"
Toolroom
Lathes

South Bend 16" x 6'
Toolroom Lathe
\$2145.25

SPECIFICATIONS	16-INCH	14½-INCH	13-INCH
Swing over bed and saddle wings...	16¼"	14⅝"	13⅞"
Swing over saddle cross slide.....	9⅝"	8-15/16"	8"
Spindle speeds.....	26 to 885 r.p.m.	27 to 800 r.p.m.	34 to 875 r.p.m.
Thread cutting range.....	4 to 224 R.H. or L.H.	4 to 224 R.H. or L.H.	4 to 224 R.H. or L.H.
Power longitudinal feeds.....	.0015" to .0841"	.0015" to .0841"	.0015" to .0841"
Power cross-feeds.....	.0006" to .0312"	.0006" to .0312"	.0006" to .0312"
Hole thru spindle.....	1⅜"	1⅞"	1"
Collet capacity.....	1"	¾"	11/16"
Spindle centers.....	No. 3 Morse Taper	No. 3 Morse Taper	No. 3 Morse Taper
Size motor.....	1½ h.p.	1½ h.p.	1 h.p.

**Toolroom Underneath Motor
Driven Lathes**

Catalog Number	Swing Over Bed Inches	Length of Bed Feet	Distance Between Centers Inches	Approx. Shipping Weight Pounds	Price f.o.b. Factory
16-INCH TOOLROOM UNDERNEATH BELT MOTOR DRIVEN LATHES					
8117-C	16¼"	6	33½"	2525	\$2145.25
8117-D	16¼"	7	45½"	2605	2191.25
8117-E	16¼"	8	57½"	2685	2237.25
14½-INCH TOOLROOM UNDERNEATH BELT MOTOR DRIVEN LATHES					
8183-B	14⅝"	5	24½"	2180	\$1843.25
8183-C	14⅝"	6	36½"	2255	1888.25
8183-D	14⅝"	7	48½"	2330	1933.25
8183-E	14⅝"	8	60½"	2405	1978.25
13-INCH TOOLROOM UNDERNEATH BELT MOTOR DRIVEN LATHES					
8113-B	13⅞"	5	28	1665	\$1577.25
8113-C	13⅞"	6	40	1715	1617.25
8113-D	13⅞"	7	52	1770	1657.25

South Bend Toolroom Lathes are equally efficient on precision toolroom work or close tolerance manufacturing operations. Their versatility reduces set-up time to a minimum. Smooth, vibration-free operation permits finish turning or boring with such precision that subsequent machine operations can often be eliminated. A convenient arrangement of controls makes for an ease of operation which reduces fatigue and lowers the probability of error. A wide range of spindle speeds permits machining work with maximum tool efficiency.

Improved Features include: alloy steel headstock spindle; replaceable headstock bearings; double wall apron; quick change gear box for threads and feeds; and semi-steel lathe bed.

In Addition to 3-ph., 60 cy., 220 v., A.C. motor and drum control, and all equipment supplied with quick change gear lathe (see preceding page) the following toolroom attachments are included in price of lathe: handwheel type draw-in collet chuck attachment; collet rack; telescopic taper attachment; thread dial indicator; chip pan; and micrometer carriage stop. Chucks, tools, and collets are extra.

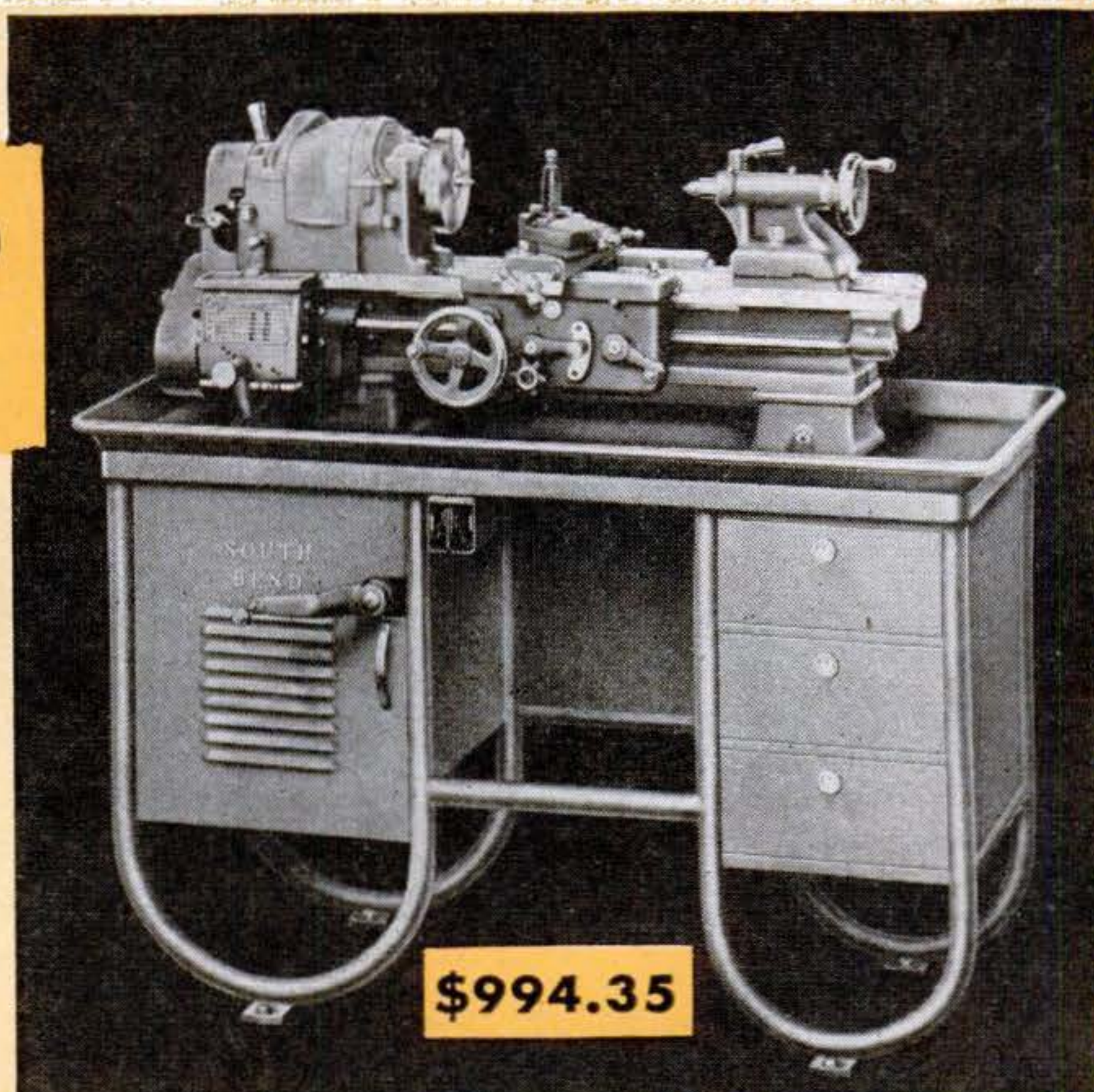
SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

SOUTH BEND

10"-1" Collet Lathes

SPECIFICATIONS

Swing over bed and saddle wings.....10 $\frac{1}{8}$ "
 Swing over saddle cross slide.....5 $\frac{3}{4}$ "
 Spindle speeds (12).....50 to 1357 r.p.m.
 Thread cutting range....4 to 224 R.H. or L.H.
 Power longitudinal feeds.... .0015" to .0836"
 Power cross-feeds..... .0006" to .0309"
 Hole thru spindle.....1 $\frac{3}{8}$ "
 Collet capacity.....1"
 Spindle centers.....No. 2 Morse Taper
 Cross slide travel.....5 $\frac{7}{8}$ "
 Compound rest top slide travel.....2"
 Size motor..... $\frac{3}{4}$ h.p.



\$994.35

10-inch Swing South Bend Precision Lathes are capable of the most exacting operations on both tool and production work. This accuracy, together with their speed and versatility, contribute to lower machining costs. They contain all the design features that make the larger models so dependable.

Price includes 3 ph., 60 cy., 220 v., A.C. motor; drum control, and regular lathe equipment such as belts, centers, face plates, tool post, etc. Chucks and tools are extra. Toolroom Lathes also include: handwheel type draw-in collet attachment (without collets); collet rack; telescopic taper attachment; thread dial indicator; and micrometer carriage stop. Bench is included in price of bench lathe.

TIME PAYMENT TERMS

25% down, balance
12 mos., moderate
finance charge
(unless federal law
requires otherwise)



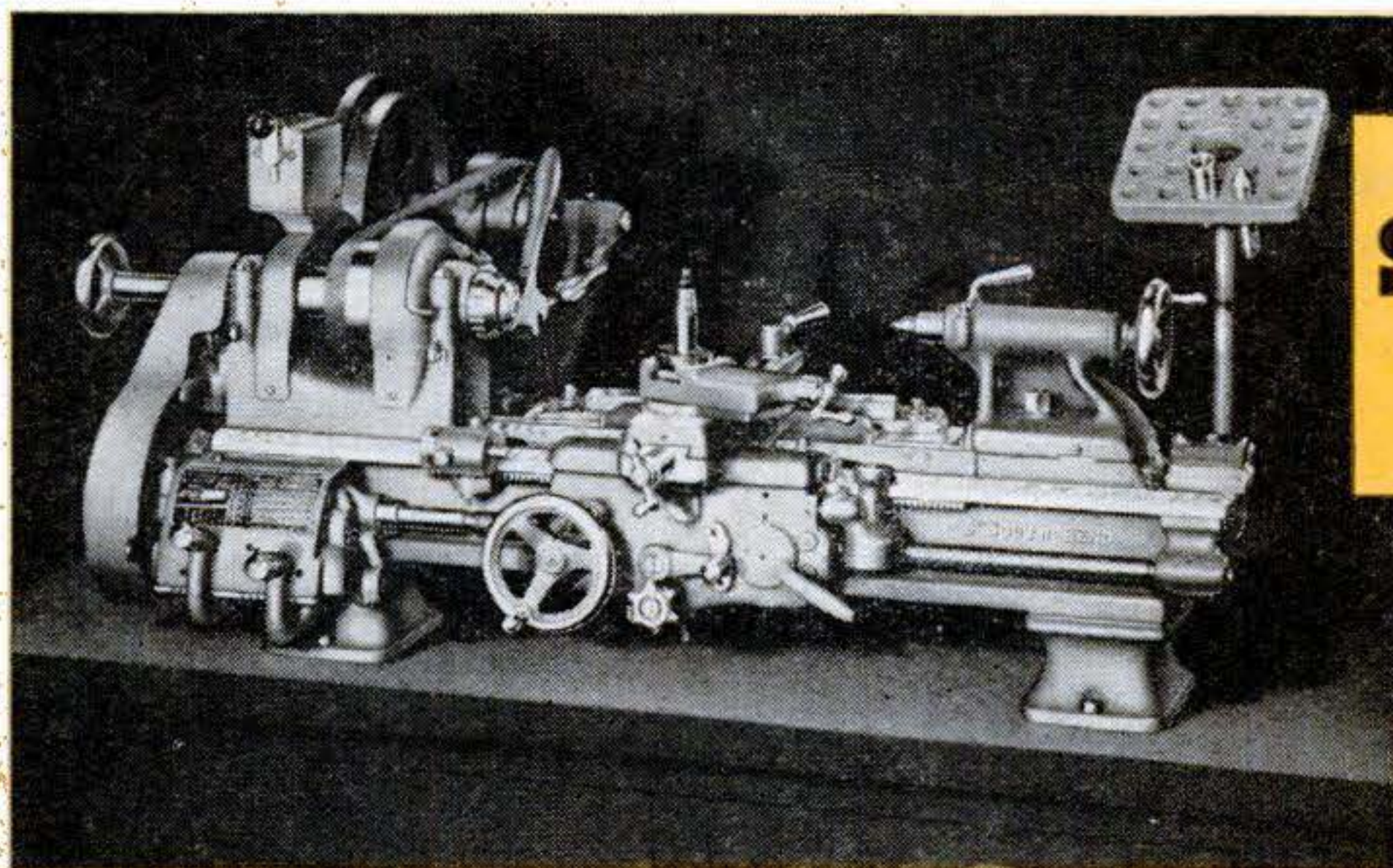
South Bend 10" x 3 $\frac{1}{2}$ ', 1" Collet Toolroom Lathe **\$1249.35**

10"-1" Collet Quick Change Gear and Toolroom Lathes

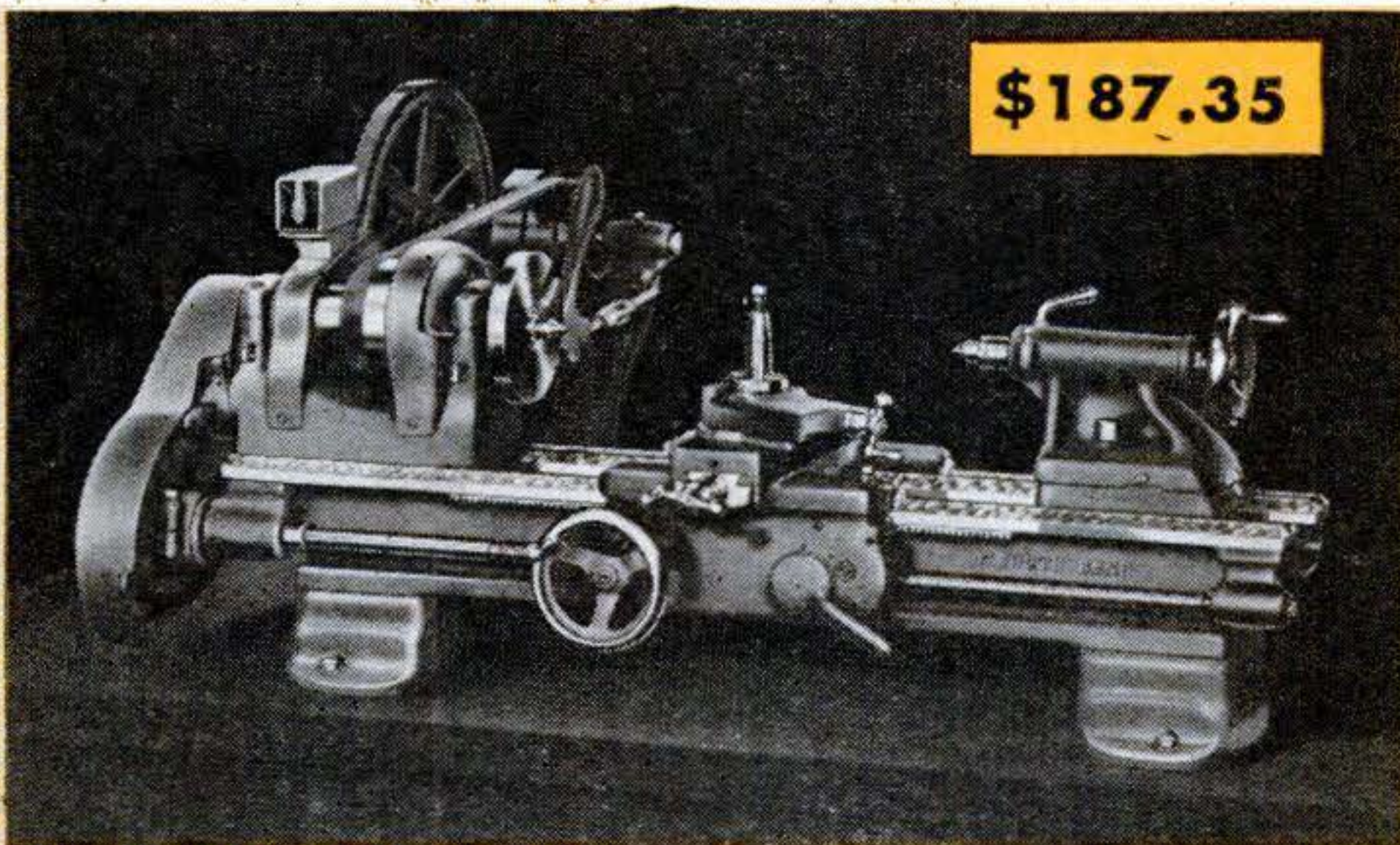
Catalog Number	Swing Over Bed Inches	Length of Bed Feet	Between Centers Inches	Shipping Weight Pounds	Price f.o.b. Factory
QUICK CHANGE GEAR BENCH LATHES					
187-YS	10 $\frac{1}{8}$	3	14 $\frac{3}{4}$	850	\$ 994.35
187-ZS	10 $\frac{1}{8}$	3 $\frac{1}{2}$	20 $\frac{3}{4}$	880	1011.35
187-AS	10 $\frac{1}{8}$	4	26 $\frac{3}{4}$	950	1038.35
187-RS	10 $\frac{1}{8}$	4 $\frac{1}{2}$	32 $\frac{3}{4}$	980	1062.35
QUICK CHANGE GEAR LATHES WITH FLOOR LEGS					
187-Y	10 $\frac{1}{8}$	3	14 $\frac{3}{4}$	810	\$924.35
187-Z	10 $\frac{1}{8}$	3 $\frac{1}{2}$	20 $\frac{3}{4}$	835	941.35
187-A	10 $\frac{1}{8}$	4	26 $\frac{3}{4}$	860	958.35
187-R	10 $\frac{1}{8}$	4 $\frac{1}{2}$	32 $\frac{3}{4}$	885	982.35

Catalog Number	Swing Over Bed Inches	Length of Bed Feet	Between Centers Inches	Shipping Weight Pounds	Price f.o.b. Factory
TOOLROOM BENCH LATHES					
8187-YS	10 $\frac{1}{8}$	3	14 $\frac{3}{4}$	960	\$1272.35
8187-ZS	10 $\frac{1}{8}$	3 $\frac{1}{2}$	20 $\frac{3}{4}$	990	1289.35
8187-AS	10 $\frac{1}{8}$	4	26 $\frac{3}{4}$	1060	1316.35
TOOLROOM LATHES WITH FLOOR LEGS					
8187-Y	10 $\frac{1}{8}$	3	14 $\frac{3}{4}$	935	\$1231.35
8187-Z	10 $\frac{1}{8}$	3 $\frac{1}{2}$	20 $\frac{3}{4}$	960	1249.35
8187-A	10 $\frac{1}{8}$	4	26 $\frac{3}{4}$	985	1267.35

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.



South Bend 9" x 3' Toolroom Bench Lathe **\$521.45**



South Bend 9" x 3' Model C Bench Lathe

SOUTH BEND

9-Inch Bench Lathes

SPECIFICATIONS

Swing over saddle wings.....9¼"
Swing over chip guard.....5½"

Spindle speeds:

6 speed drive.....41 to 658 r.p.m.
12 speed drive.....41 to 1270 r.p.m.

Thread cutting range:

Model A.....48 pitches R.H. or L.H.
4 to 224 per inch

Models B & C...45 pitches R.H. or L.H.
4 to 160 per inch

Power longitudinal feeds:

Model A.....48—.0015" to .0853"

Model B.....26—.0021" to .0155"

Model C.....14—.0021" to .0156"

Power cross feeds:

Model A.....48—.0004" to .0252"

Model B.....23—.001" to .0046"

Belt, width of pulley step for.....1"

Centers, Morse taper.....No. 2

Collet capacity, maximum.....½"

Headstock spindle hole.....¾"

Lead screw 29° Acme Thread.....¾"—8

Motor, size required:

For 6-speed drive.....¼ h.p.

For 12-speed drive.....½ h.p.

Spindle nose threads.....1½"—8

Tailstock top set over.....5/8"

Tool holder cutter bit.....¼" sq.

Tool holder shank.....3/8" x 13/16"

Approx. shipping weights:

3 ft. bed lathe.....355 lbs.

3½ ft. bed lathe.....380 lbs.

4 ft. bed lathe.....405 lbs.

4½ ft. bed lathe.....430 lbs.

Model A 9-inch Lathes have heat-treated alloy steel spindle, quick change gear box, and friction clutch worm drive for power longitudinal feeds and power cross-feeds.

Model B 9-inch Lathes are same as Model A Lathes except that they have independent change gears, instead of the quick change gear box, for threads and feeds.

Model C 9-inch Lathes are same as Model B Lathes except they do not have the worm drive for power feeds. The cross-feed is hand-operated, and

longitudinal feeds are obtained by engaging half-nuts with the lead screw.

Toolroom 9-inch Lathes are same as Model A Lathes except that they have the following toolroom attachments: collet chuck; collet rack; taper attachment; thread dial; and micrometer carriage stop.

Price includes 1 ph., 60 cy., 115 v., A.C. instant reversing motor, drum control, and regular lathe equipment such as belts, centers, small face plate, tool post, etc. Chucks, collets, and tools are extra.

9-Inch Swing Horizontal Motor Driven South Bend Precision Bench Lathes

Length Bed Feet	Be- tween Cent- ers Inches	9" TOOLROOM LATHES		9" MODEL A LATHES				9" MODEL B LATHES				9" MODEL C LATHES			
				6-speed drive		12-speed drive		6-speed drive		12-speed drive		6-speed drive		12-speed drive	
		Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
3	16	8644-Y	\$521.45	444-Y	\$298.35	644-Y	\$340.45	477-Y	\$240.35	677-Y	\$282.45	415-YC	\$187.35	615-YC	\$229.45
3½	22	8644-Z	537.45	444-Z	314.35	644-Z	356.45	477-Z	256.35	677-Z	298.45	415-ZC	203.35	615-ZC	245.45
4	28	8644-A	553.45	444-A	330.35	644-A	372.45	477-A	272.35	677-A	314.45	415-AC	219.35	615-AC	261.45
4½	34	.....	.....	444-R	353.35	644-R	395.45	477-R	295.35	677-R	337.45	415-RC	242.35	615-RC	284.45

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

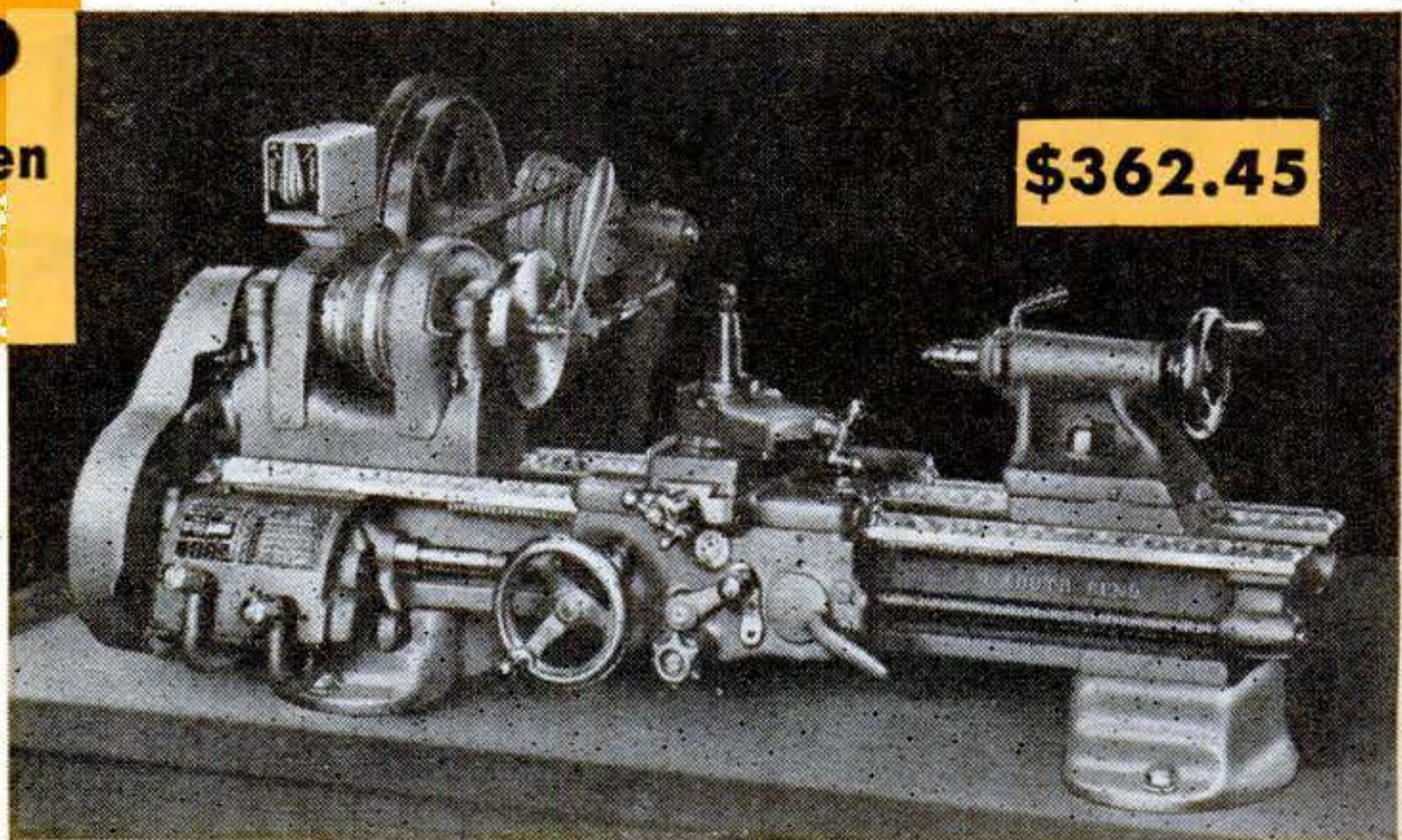
9" SOUTH BEND V-Belt Horizontal Motor Driven Bench Lathes

The 9" Bench Lathes with 8-speed and 16-speed V-belt horizontal motor drives offer more spindle speeds—an advantage when surface speeds are critical. These lathes are identical in all other respects to those described on the preceding page.

Price includes 1 ph., 60 cy., 115 v., A.C. motor, drum control, and regular lathe equipment such as belt, centers, small face plate, tool post, etc. Chucks, collets, tools, and bench are extra.

TIME PAYMENT TERMS

25% down,
balance 12 mos.,
moderate finance
charge (unless
federal law re-
quires otherwise)



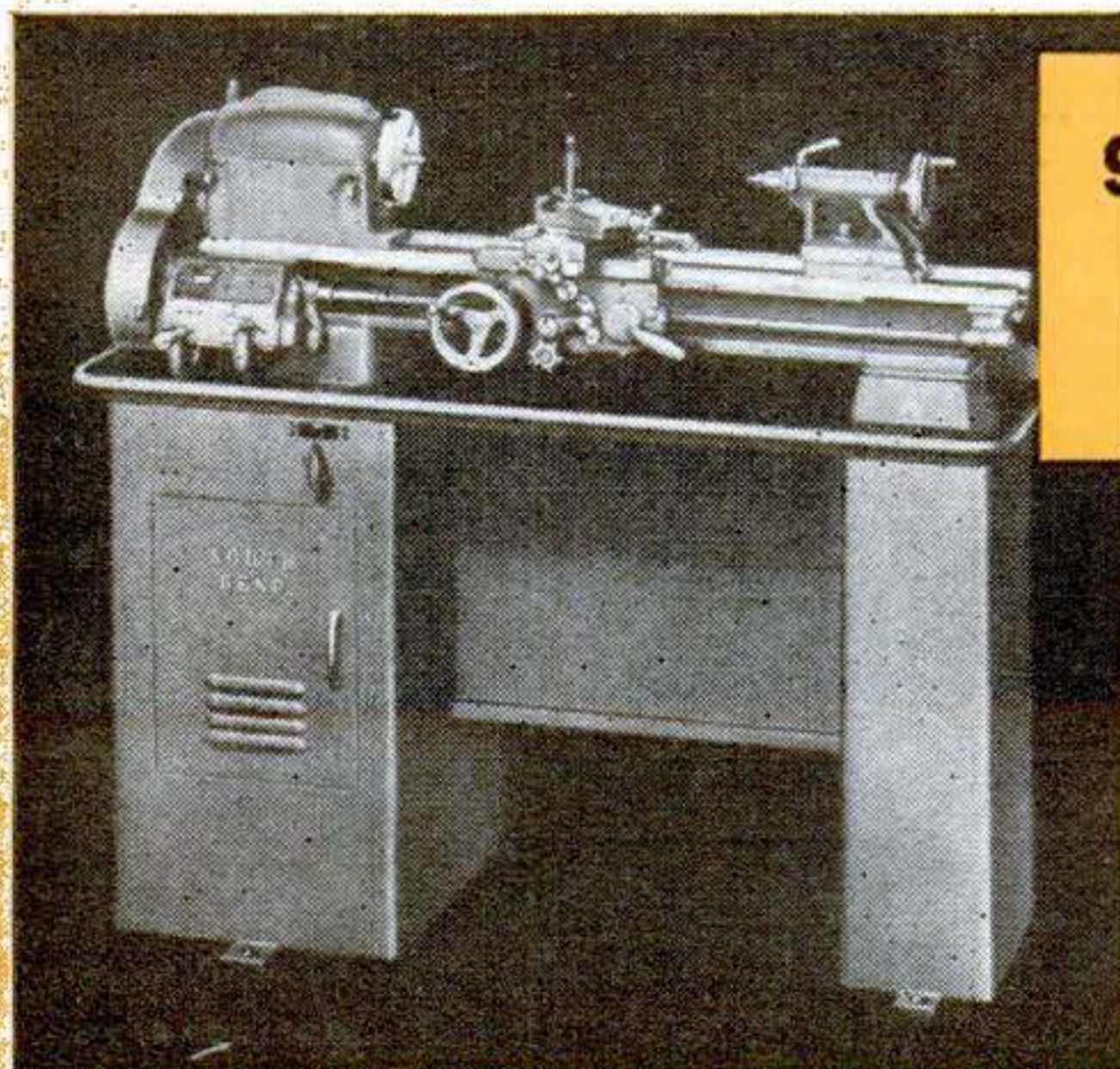
SPECIFICATIONS

Swing over saddle wings.....9¼"
Swing over chip guard.....5½"
Hole thru spindle.....¾"
Collet capacity.....½"
Spindle speeds
8 speed drive....46 to 609 r.p.m.
16 speed drive....46 to 1176 r.p.m.
Thread cutting range:
Model A.....48 pitches R.H. or L.H.
4 to 224 per inch.
Models B & C .45 pitches R.H. or L.H.
4 to 160 per inch.

Power longitudinal feeds
Model A.....48—.0015" to .0853"
Model B.....26—.0021" to .0155"
Model C.....14—.0021" to .0156"
Power cross-feeds
Model A.....48—.0004" to .0252"
Model B.....23—.001" to .0046"
Spindle centers.....No. 2 Morse Taper
Size motors
8 speed drive.....¼ h.p.
16 speed drive.....½ h.p.

9-Inch Bench Lathes with V-Belt Horizontal Motor Drive

Length Bed Feet	Between Centers Inches	Ship. Wt. Crated Pounds	MODEL A				MODEL B				MODEL C			
			8-speed drive		16-speed drive		8-speed drive		16-speed drive		8-speed drive		16-speed drive	
			Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
3	16	355	544-Y	\$321.35	744-Y	\$362.45	577-Y	\$263.35	777-Y	\$304.45	515-YC	\$210.35	715-YC	\$251.45
3½	22	380	544-Z	337.35	744-Z	378.45	577-Z	279.35	777-Z	320.45	515-ZC	226.35	715-ZC	267.45
4	28	405	544-A	353.35	744-A	394.45	577-A	295.35	777-A	336.45	515-AC	242.35	715-AC	283.45
4½	34	430	544-R	376.35	744-R	417.45	577-R	318.35	777-R	359.45	515-RC	265.35	715-RC	306.45



9" SOUTH BEND Underneath Motor Driven Lathe

Capable of machining work to the most exacting tolerances, this lathe is recommended for precision work in the toolroom, laboratory, or machine shop. Fully enclosed motor drive unit provides twelve spindle speeds, 41 to 1270 r.p.m. See above for other specifications. Price includes 1 ph., 60 cy., 115 v., A.C. motor, drum control, and regular lathe equipment. Chucks, collets, and tools are extra.

9" Underneath Motor Driven Lathes

Catalog Number	Model	Length of Bed Feet	Between Centers Inches	Weight Crated Pounds	Price f.o.b. Factory
344-ZN	A	3½	22	570	\$512.45
377-ZN	B	3½	22	560	454.45
8344-ZN	Toolroom	3½	22	630	693.45

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

SPECIFICATIONS	SERIES 900	SERIES 1000	SERIES 2-H
Collet capacity.....	1/2"	1"	1"
Hole thru spindle.....	3/4"	1 1/8"	1 3/8"
Swing over bed and saddle wings.....	9 1/4"	10 1/8"	16 1/4"
Swing over double tool-slide.....	3-9/16"	3-9/16"	6 7/8"
Swing over compound slide.....	5 1/2"	5 7/8"	
Turret tool feed.....	4"	4"	6 1/8"
Turret face to spindle distance, max.....	20 3/8"	19 3/8"	6' bed—28 1/4"
Double tool slide cross travel.....	3 5/8"	3 5/8"	9 3/4"
Thread cutting range, 48..	4—224 per in.	4—224 per in.	4—224 per in.
Spindle speeds, 12.....	41-1270 r.p.m.	50-1357 r.p.m.	16-880 r.p.m.
Carriage power feeds:			
Longitudinal, 48.....	.0015"—.0853"	.0015"—.0836"	.0015"—.0841"
Transverse, 48.....	.0004"—.0252"	.0006"—.0309"	.0006"—.0312"
Carriage longitudinal travel.....	18"	16"	6' bed—22 1/2"
Turret power feeds.....	.....	.....	.0001"—.0148"
Turret indexing tolerance at 4" from turret face.....	.0005"	.0005"	.0005"
Size motor.....	1/2 h.p.	3/4 h.p.	2-1 h.p.

SOUTH BEND

Precision Turret Lathes

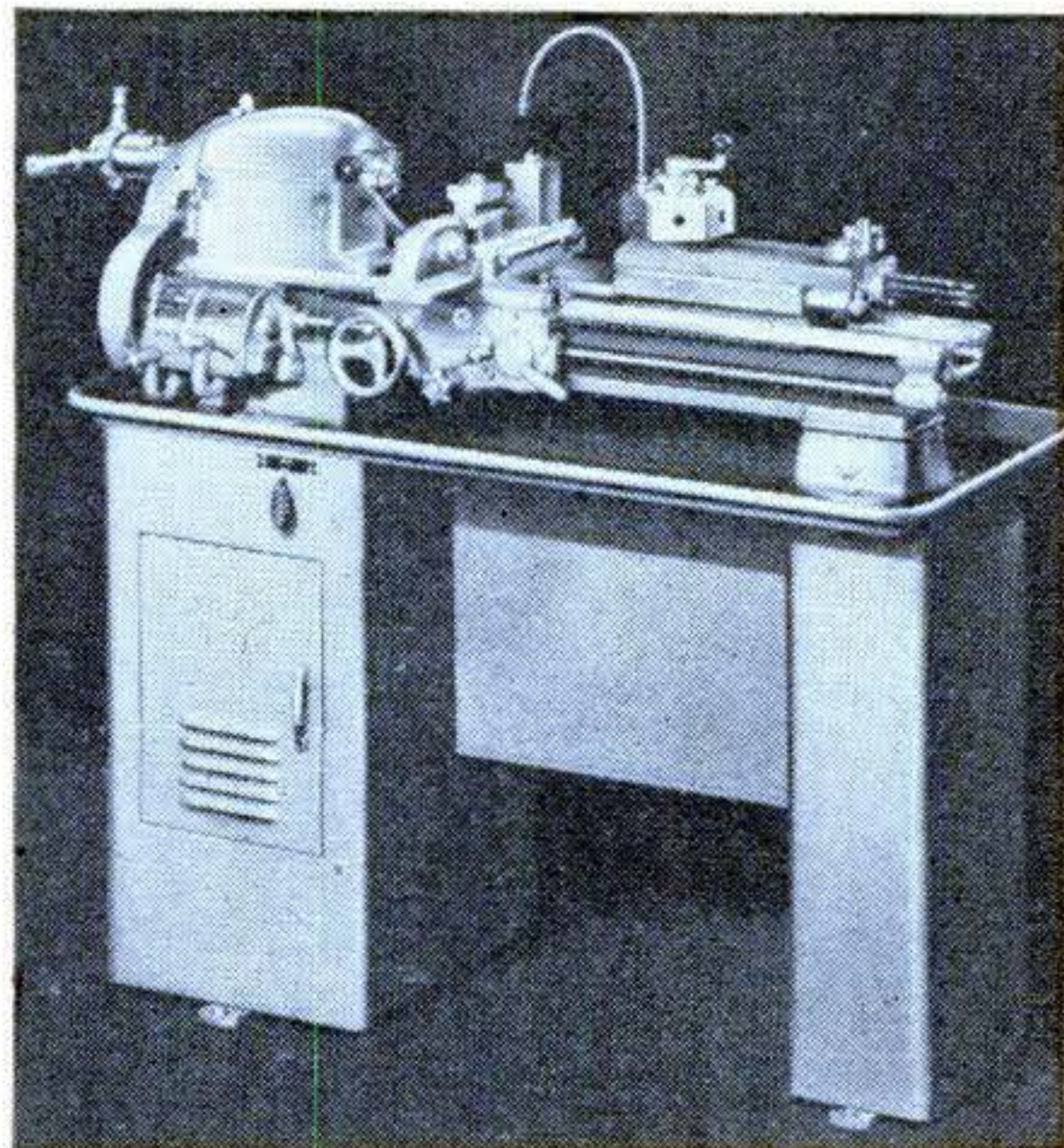
Series 900. This turret lathe is specifically designed for second operations on small, precision parts. Its accuracy, and speed of handling and machining produce appreciable economies in manufacturing that are not possible with heavy turret lathes. Price includes 1 ph., 60 cy., 115 v.,

A.C. motor, drum control, power feed universal carriage, handlever bed turret, handlever cross slide, compound rest cross slide, coolant return assembly, and metal column base with built-in oil pan.

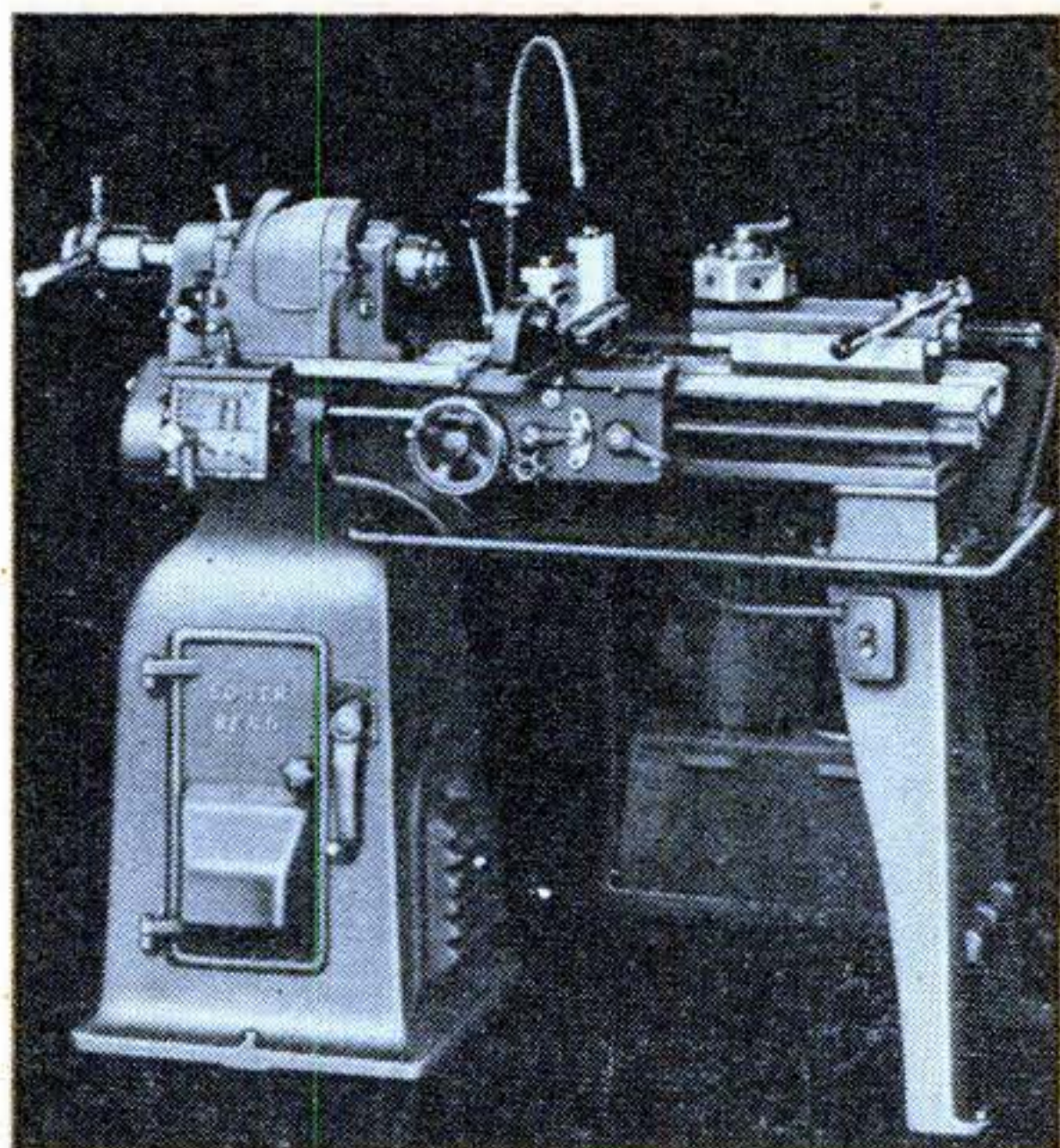
Series 1000. Designed for the same types of applications as the Series 900, these turret lathes with their larger capacities are ideal for machining a wide variety of precision parts. Numerous choices of spindle speeds, power longitudinal and transverse carriage feeds, and thread cutting feeds keep production efficient. Price includes 3 ph., 60 cy., 220 v., A.C. motor, drum control, power feed universal carriage, handlever bed turret, handlever cross slide, compound rest cross slide, oil pan, and coolant return assembly.

Series 2-H. The production of precision duplicate parts in both machine shops and toolrooms is simplified with 2-H Turret Lathes. They are especially suited for exacting second operations on large work because of their accuracy and ease of operation. Price includes 2-speed, 3 ph., 60 cy., 220 v., A.C. motor, drum control, power feed universal carriage with screw feed double tool slide having front and rear tool blocks, power feed ram-type turret, and oil pan.

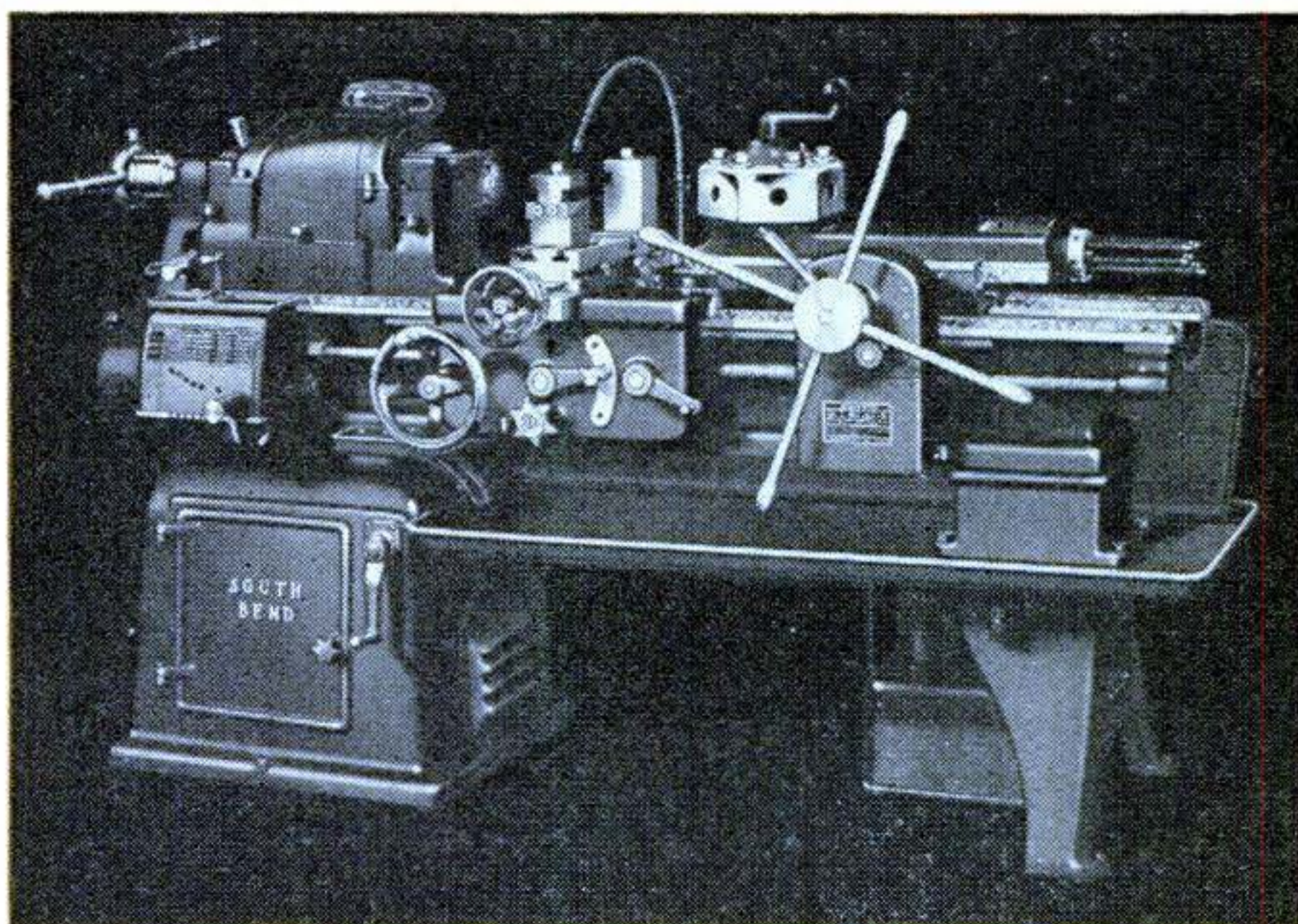
Prices do not include coolant pump, splash pan or collet equipment.



Ser. 900, Cat. No. 930-Z Turret Lathe \$805.45

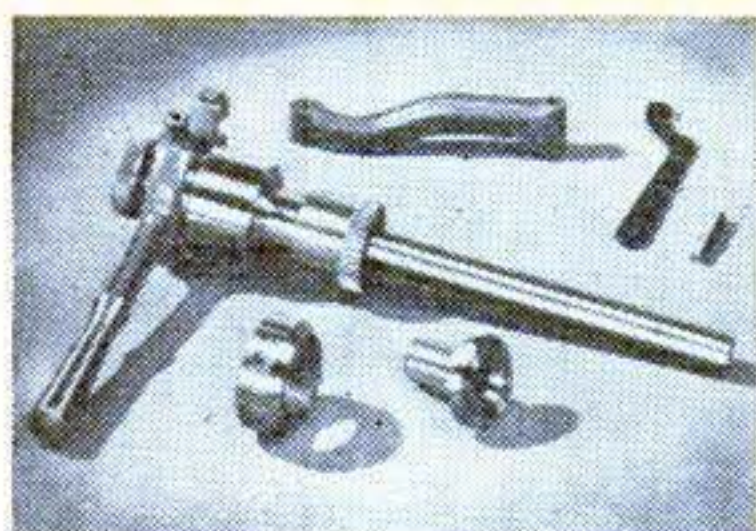


Ser. 1000, Cat. No. 1006-Z Turret Lathe \$1279.35



Series 2-H, Cat. No. 2-CT Turret Lathe (6' bed) \$2692.35

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.



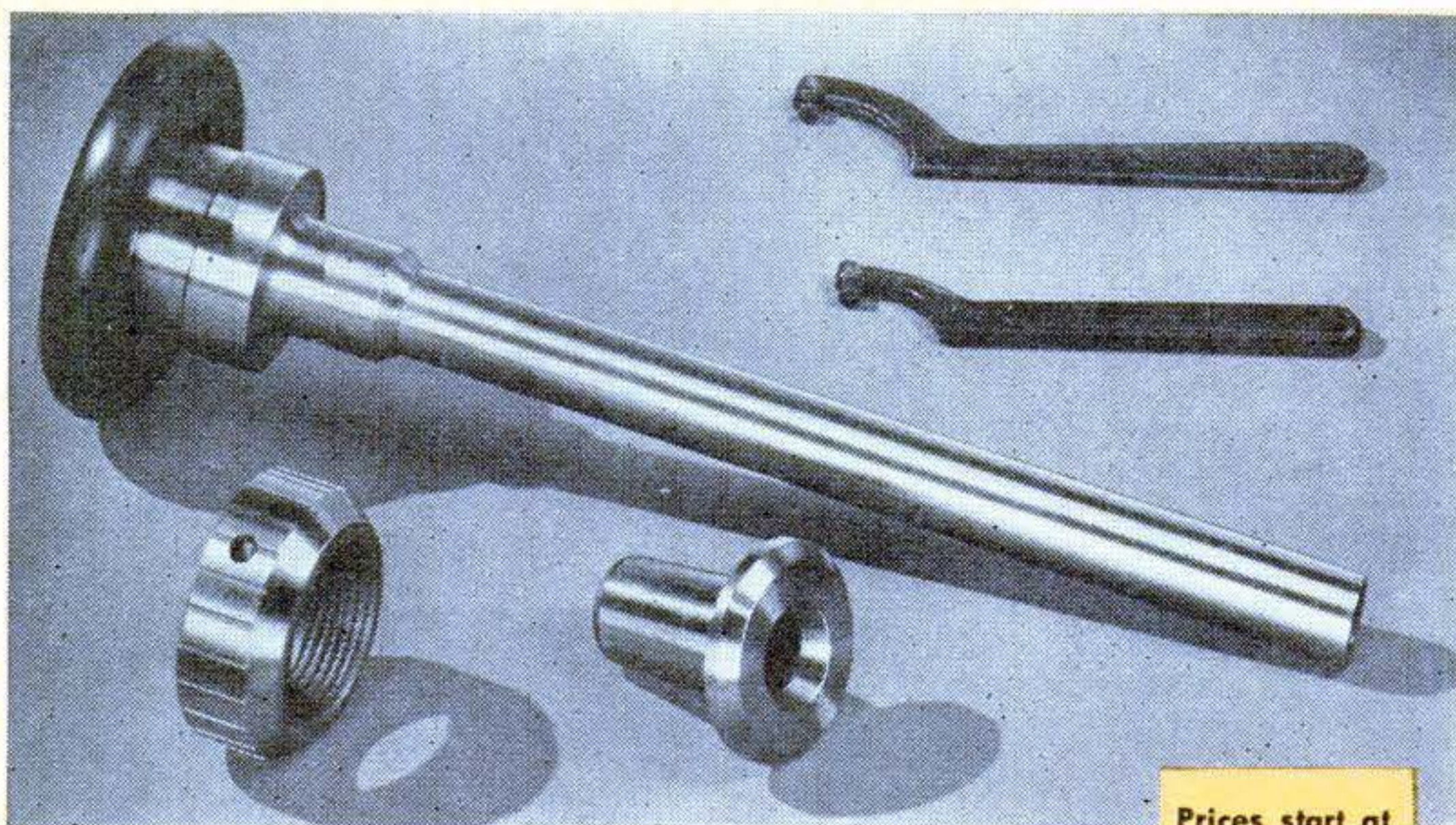
HANDLEVER COLLET ATTACHMENT

The Handlever Collet Attachment is an aid to rapid production work. Stock can be released and fed through the collet without stopping the lathe.

Collet Attachment

HANDWHEEL TYPE

The Handwheel Collet Attachment is a very accurate type of chuck. It is used for precision toolroom work and for the manufacture of small parts, or wherever extremely close tolerances are required. Bar and tube stock can be fed through the hollow draw-bar that operates the collet. Equipment includes draw-bar, spindle nose cap, spanner wrench, and closing sleeve. Collets are not included.



Handwheel Draw-in Collet Attachment

Prices start at
\$26

DRAW-IN COLLET ATTACHMENTS

Size of Lathe	Collet Required	Max. Collet Cap.	Handwheel Type		Handlever Type	
			Catalog Number	Price	Catalog Number	Price
9" and Series 900.....	No. 3	1/2"	4306-W	\$26	5206-W	\$ 89
10"—11/16" Collet.....	No. 2	11/16"	4310	42	5210	126
10"—1" Col. & Series 1000.	No. 5	1"	4312	52	5219	158
13"—11/16" Collet.....	No. 2	11/16"	4313	42	5213	126
13"—1" Collet.....	No. 5	1"	4313-Q	52	5213-Q	158
14 1/2"—3/4" Collet.....	No. 4	3/4"	4314	47	5214	147
14 1/2"—1" Collet.....	No. 5	1"	4314-M	52	5214-M	158
16", 16/24", & No. 2-H.....	No. 5	1"	4316	52	5216	158

Collet Rack and Collet Chest

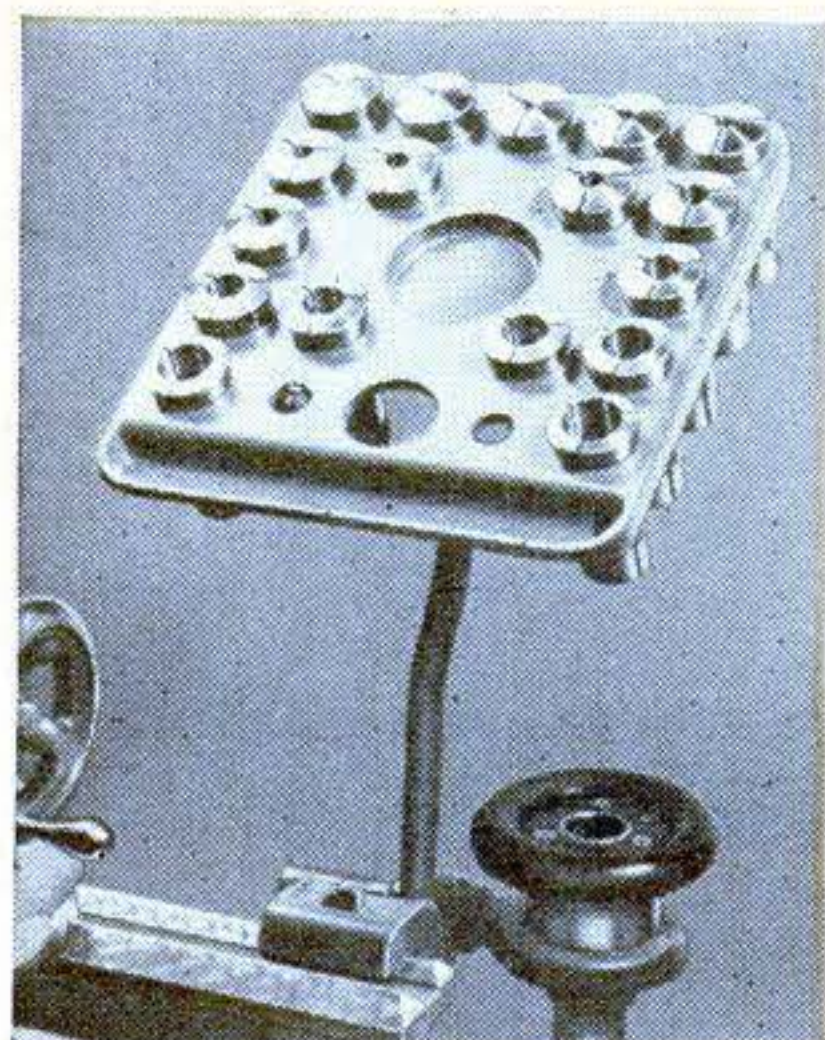
Collet Rack No. 1770-W holds 19 collets, all others hold 17 collets. Collets are not included.

COLLET RACKS

Catalog Number	Size of Lathe	Price
1770-W	9" and 900	\$13
1752	10"—11/16" Col.	16
1753	10"—1" C & 1000	18
1772	13"—11/16" Col.	16
1772-Q	13"—1" Col.	18
1791	14 1/2"—3/4" Col.	18
1774	14 1/2", 16" & 16/24"	18

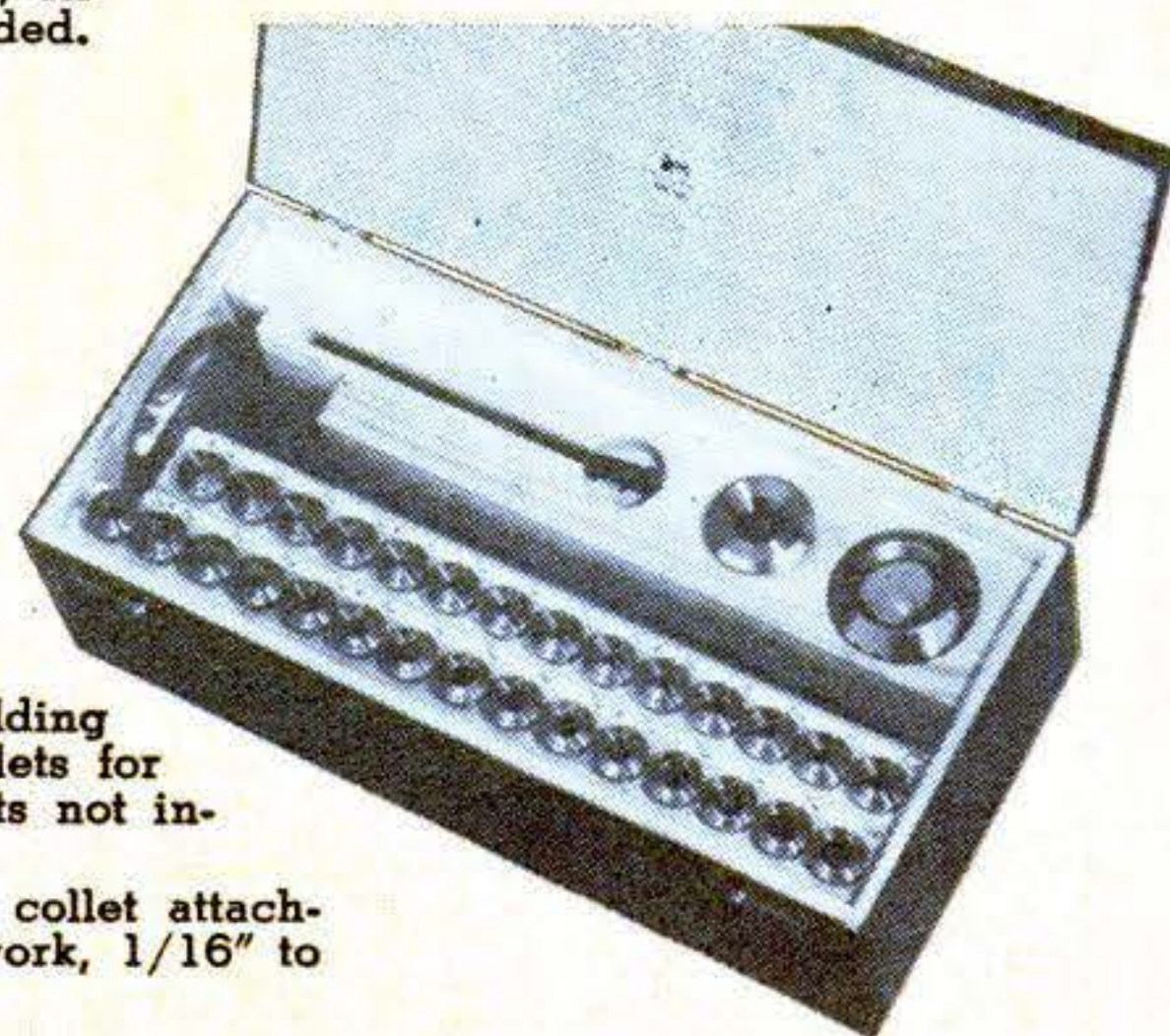
No. 2225—Collet Chest only, for holding handwheel collet attachment and collets for 9" lathe. Collet attachment and collets not included. Price: \$7.50.

No. 2220—Collet Chest, 9" handwheel collet attachment and 29 steel collets for round work, 1/16" to 1/2" by 64ths. Complete: \$123.00.



COLLET RACK

Holds collets, centers, spindle sleeve, draw-bar, spindle nose cap, wrench, etc.



COLLET CHEST

Holds handwheel collet attachment and 29 collets. Well constructed of wood.

TIME PAYMENT TERMS

When order includes lathe, 25% down, balance 12 mos., moderate finance charge (unless federal law requires otherwise)

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U. S. A.

SOUTH BEND LATHE ATTACHMENTS

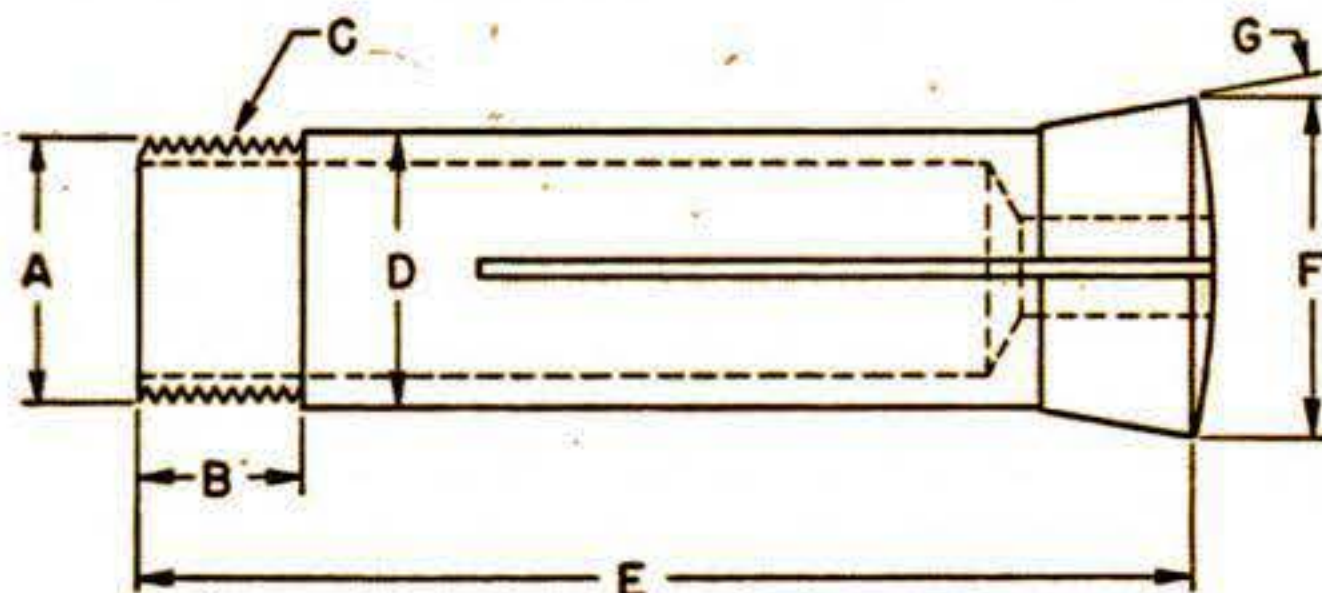
Collets and Collet Sets

South Bend Collets, manufactured with the same exacting care as South Bend Lathes, deliver long, dependable service on precision work. Each collet is carefully inspected and tested, and packed in substantial plastic box with transparent lid through which the size can be read for easy selection.

Steel Collets are carefully heat-treated for maximum service and are precision ground to exceedingly close tolerances.

Brass Collets, a South Bend innovation, have many practical applications.

Their low cost makes them desirable for odd sizes that are used only occasionally. They can be readily machined on the job for holding tapered or irregular shapes. When worn, they can be rebores to larger diameters.



Steel Collet



Brass Collet



Collet Packaged in Plastic Box

Specifications of Steel and Brass Collets

Collet Number	* For South Bend Lathes	A Thread Diameter Inches	B Thread Length Inches	C Threads Per Inch	D Body Diameter Inches	E Collet Length Inches	F Head Diameter Inches	G Head Angle Degrees
3	9" and Series 900	.650	3/4	26	.6495	2-11/16	.852	12
2	10" and 13"—11/16" Collet	.855	13/16	20	.8595	3-5/16	1.095	15
5	10", 13", 14 1/2", 16"—1" Collet 16/24", 2-H, 1000	1.250	3/4	20	1.2495	3-9/32	1.452	10
4	14 1/2"—3/4" Collet	.950	13/16	20	.9495	3	1.150	10

*Collets can also be used on any other lathe or machine which they will fit.

South Bend Collets and Collet Sets

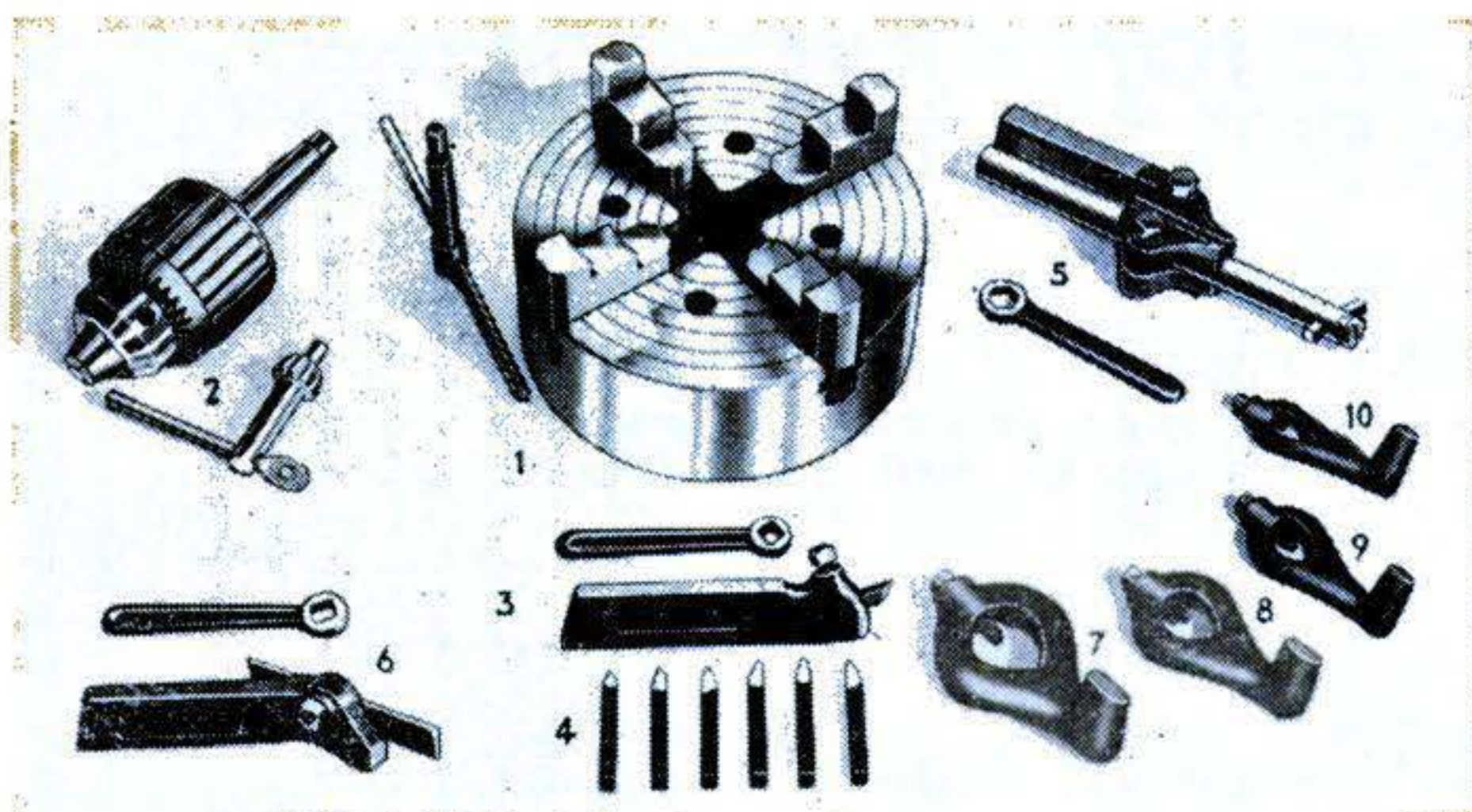
Collet	Description	Steel Collets		Brass Collets	
		Cat. No.	Price	Cat. No.	Price
No. 3	1 Collet, any standard size 1/16" to 1/2" in 64ths.....	609-W	\$ 3.75	1696	\$ 2.00
	Set of 8 Collets in 16ths, 1/16" to 1/2".....	2047	27.00	2235	15.00
	Set of 7 Collets in odd 32nds, 3/32" to 15/32".....	2476	24.00	2534	13.00
	Set of 14 Collets in odd 64ths, 5/64" to 31/64".....	2477	46.00	2535	24.00
	Decimal Collets (.0625" to .500") each.....	769-W	4.00	1856	2.15
	Metric Collets (1.5 mm to 12.5 mm) each.....	773-W	4.00	1702	2.15
No. 2	1 Collet, any standard size 1/16" to 11/16" in 64ths.....	1721	4.00	1697	2.25
	Set of 11 Collets in 16ths, 1/16" to 11/16".....	2432	39.00	2238	23.00
	Set of 10 Collets in odd 32nds, 3/32" to 21/32".....	2478	36.00	2536	21.00
	Set of 20 Collets in odd 64ths, 5/64" to 43/64".....	2479	71.00	2537	40.00
	Decimal Collets (.0625" to .6875") each.....	769-N	4.25	1857	2.40
	Metric Collets (1.5 mm to 17.0 mm) each.....	773-N	4.25	1703	2.40
No. 5	1 Collet, any standard size 1/16" to 1" in 64ths.....	1722	4.75	1698	2.50
	Set of 16 Collets in 16ths, 1/16" to 1".....	2435	68.00	2241	37.00
	Set of 15 Collets in odd 32nds, 3/32" to 31/32".....	2482	64.00	2540	35.00
	Set of 30 Collets in odd 64ths, 5/64" to 63/64".....	2483	127.00	2541	65.00
	Decimal Collets (.0625" to 1.000") each.....	769-R	5.00	1858	2.65
	Metric Collets (1.5 mm to 25.0 mm) each.....	773-R	5.00	1704	2.65
No. 4	1 Collet, any standard size 1/16" to 3/4" in 64ths.....	1713	4.25	1699	2.35
	Set of 12 Collets in 16ths, 1/16" to 3/4".....	2438	46.00	2244	26.00
	Set of 11 Collets in odd 32nds, 3/32" to 23/32".....	2480	42.00	2538	24.00
	Set of 22 Collets in odd 64ths, 5/64" to 47/64".....	2481	81.00	2539	45.00
	Decimal Collets (.0625 to .7500") each.....	769-K	4.50	1859	2.50
	Metric Collets (1.5 mm to 19.0 mm) each.....	773-K	4.50	1705	2.50

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

NOVEMBER 1948 SB9

Chuck and Tool Assortments

The chucks and tools in the assortments shown are recommended for use with the various South Bend Lathes. This is the basic equipment required for the average shop for general machine work, such as turning, boring, drilling, cutting-off, chucking, etc. A 3-jaw Universal chuck can be substituted for the 4-jaw Independent at additional cost.



Contents of Assortment

4-Jaw Independent Lathe Chuck fitted to lathe. Sizes: 6 in. on 9" and 10" Lathes; 7½ in. on 13" Lathe; 9 in. on 14½" Lathe; 10 in. on 16" and 16/24" Lathes.

Jacobs 3-Jaw Drill Chuck. Sizes: ½ in. on 9" and 10" Lathes; ¾ in. on 13" and 14½" Lathes; 1 in. on 16" and 16/24" Lathes.

Arbor Fitted to Above Drill Chuck.

Straight Shank Tool Holder.

6 Ground Cutter Bits for Tool Holder.

Boring Tool Holder, Style "B." 9" Lathes take Style "D."

Cutting-Off Tool Holder, Right-Hand.

4 Malleable Lathe Dogs. Sizes: ½", ¾", 1", and 1¼" on 9" and 10" Lathes; ½", ¾", 1", and 1½" on all others.

Prices of Complete Assortments

Size of Lathe	Catalog No.	Price
9" & 900.....	105-WT	\$53.89
10"—11/16" Collet.....	110-T	92.72
10"—1" Collet & 1000...	110-L	93.72
13"—11/16" Collet.....	113-T	109.41
13"—1" Collet.....	113-TQ	110.41
14½"—¾" Collet.....	114-T	123.28
14½"—1" Collet.....	114-TM	136.28
16" & 16/24".....	116-T	144.28

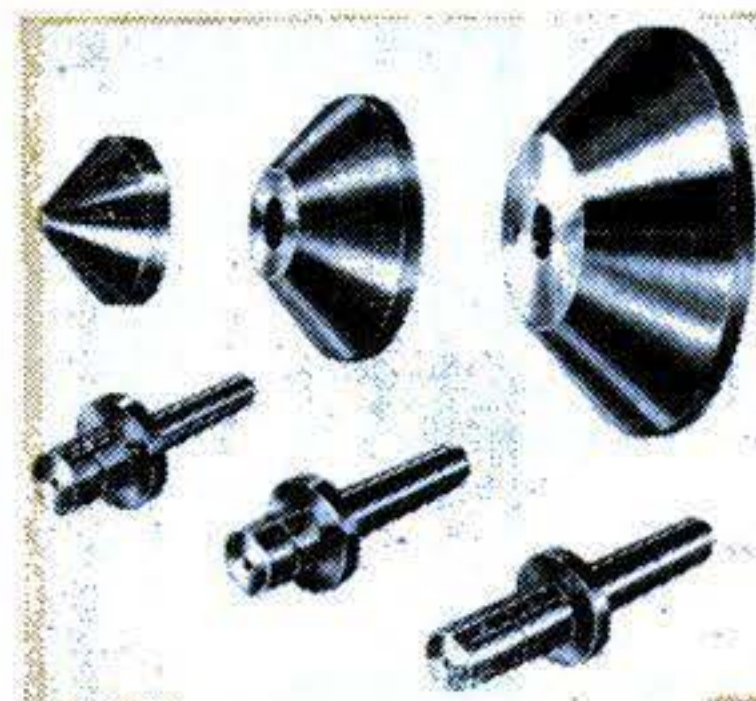
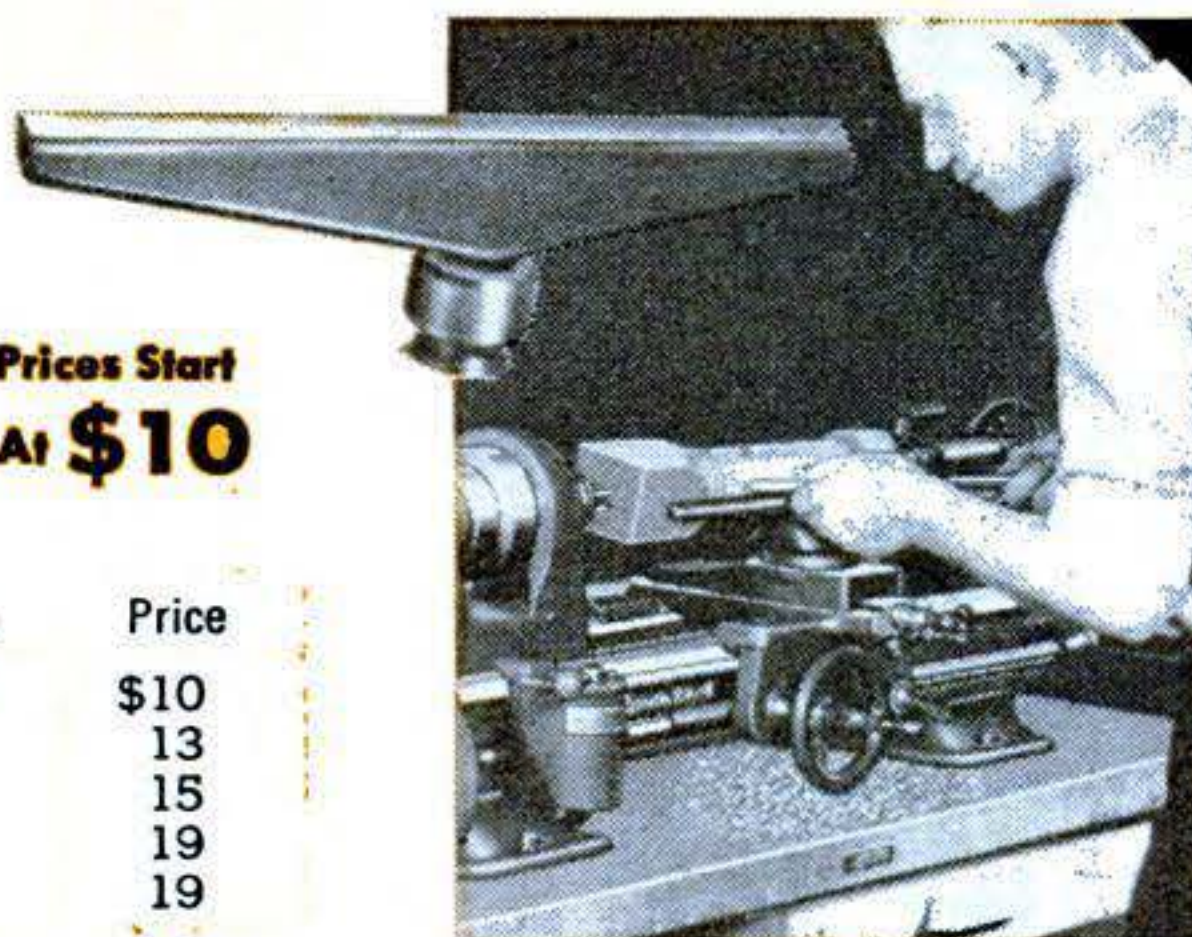
Wood Turning Rest

Mounts on compound rest base to convert lathe for wood turning. See page 14 for wood turning centers.

Price includes socket and two T-rests, 4" and 12" wide.

Size of Lathe	Catalog No.	Price
9".....	896-W	\$10
10".....	1069	13
13".....	1073	15
14½".....	1165	19
16" and 16/24".....	1075	19

Prices Start
At **\$10**

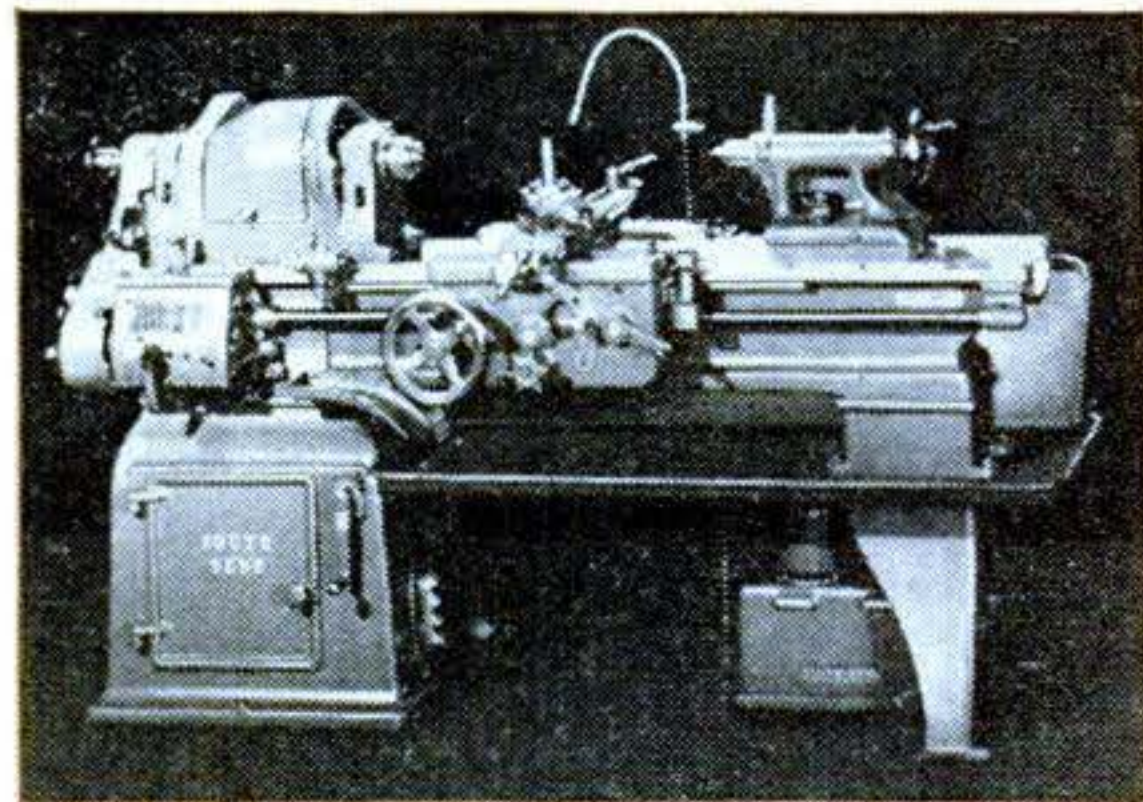


Pipe Centers

Cat. No.	Takes Pipe	Requires Shank	Price
2160	½" to 3"	2172-NR	\$4.75
2161	3" to 5"	2172-TH	6.50
2162	5" to 8"	2173-TH	9.75

Pipe Center Shanks

Cat. No.	Taper	Price
2172-NR	No. 2	\$4.75
2172-TH	No. 3	4.75
2173-TH	No. 3	8.00



Chip Pans and Oil Pans

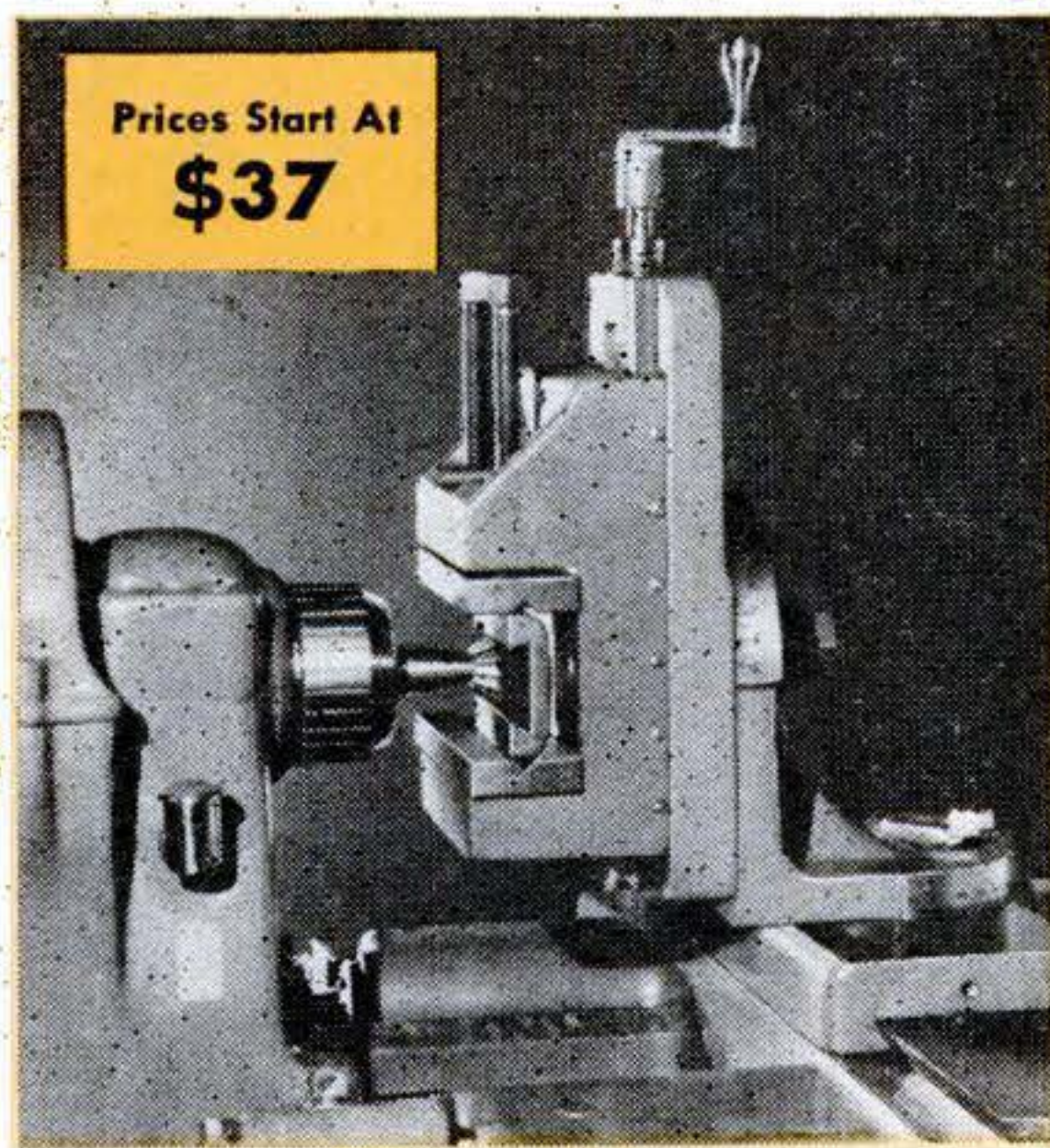
Oil Pans, Splash Pans, and Chip Pans can be supplied for all South Bend Lathes. Oil Pans should be factory-installed for proper fit. Complete information and prices will be supplied on request.

**TIME
PAYMENT
TERMS**

When order includes lathe
25% down
balance 12 mos.,
moderate finance
charge (unless
federal law re-
quires otherwise)

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

Milling and Keyway Cutting Attachment



Milling and Keyway Cutting Attachment

This useful attachment is ideal for shops not having enough of this work to justify a milling machine. Mounts on compound rest base of lathe, permitting the power cross and longitudinal feeds to be used for milling, boring and keyway cutting operations on work held in the milling attachment vise. Vise swivels in any direction, 180° horizontal and vertical graduations. Vertical slide adjusting screw equipped with micrometer graduated collar.

Size Lathe	Cat. No.	Vise Cap.	Price
9" & 900	9-W	1 1/2"	\$37
10" & 1000	1-N	1 3/4"	47
13"	3	2 7/8"	58
14 1/2"	4-K	4"	68
16", 16/24"	5	4"	79

Arbors for Milling Cutters



Holds cutters with 1" holes. Capacity between nut and shoulder, 1 1/2". 3 spacing collars furnished. All shanks No. 3 Morse Taper.

Lathe Size	Catalog No.	Price
9" & 900	109-NH	\$7.50
10" & 1000	109-NH	7.50
13"	109-NH	7.50
14 1/2"	109-NH	7.50
16", 16/24"	109-NH	7.50

Thread Dial Indicator

Eliminates reversing of lathe spindle when cutting threads. Dial is numbered and graduated to show when to close half-nuts on lead screw to catch the thread on the next successive cut, after returning carriage to starting point.

Lathe Size	Catalog No.	Price
9" & 900	810-W	\$ 9
10" & 1000	1588	14
13"	813	16
14 1/2"	813	16
16", 16/24", 2-H	813	16

Micrometer Carriage Stop

Locates the carriage at any point along the bed for accurate facing, turning, boring, etc. Has accurately graduated micrometer collar. Stop is hardened on both ends for use on either side of carriage. Can be locked for duplicate work.

Size of Lathe	Catalog No.	Price
9" & 900	968-W	\$16
10" & 1000	1518	17
13"	973	19
14 1/2"	975-FH	20
16", 16/24", 2-H	975-FH	20

Follower Rest

Supports long, slender shafts being machined between centers. Attaches to, and travels with, the carriage. Adjusting screws and lock screws are provided for setting the jaws in position. Slots in bottom of follower rest permit quick attachment or removal.

Size of Lathe	Catalog No.	Capacity		Price
		Max.	Min.	
9" & 900	34-W	2"	3/16"	\$5.00
10" & 1000	1353	2 1/2"	3/16"	7.50
13"	376	3 1/4"	3/16"	8.50
14 1/2"	1351	4 1/4"	3/16"	10.00
16"	730	4 1/4"	3/16"	11.00
16/24"	1352	4 1/4"	3/16"	16.00

Center Rest

Clamps on inside ways of lathe bed and is used for supporting long shafts, boring spindles, etc. The 3 jaws are adjustable, and are made of cast iron. Top of center rest is hinged to facilitate inserting and removing shafts.

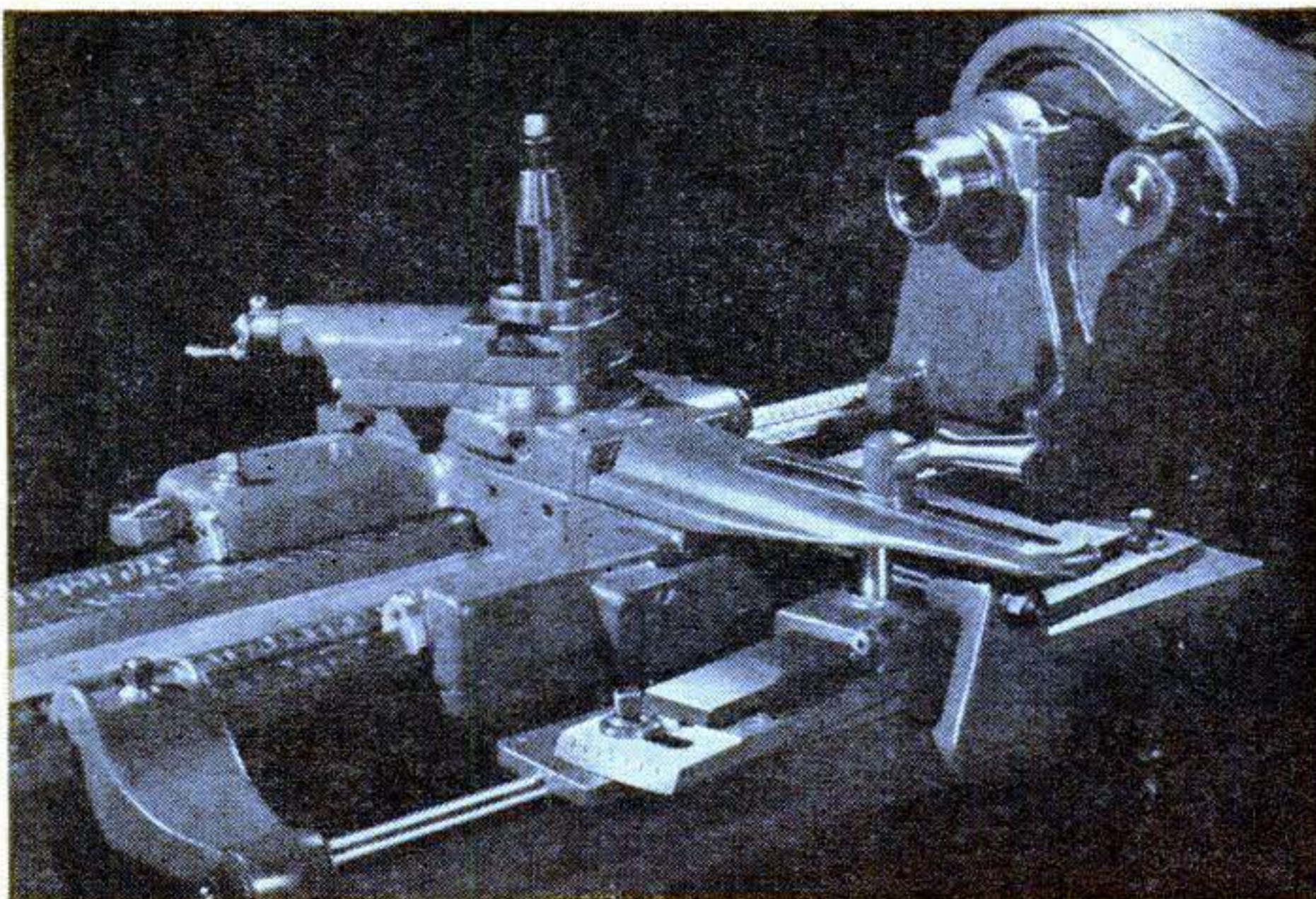
Size of Lathe	Catalog No.	Capacity		Price
		Max.	Min.	
9" & 900	125-W	3"	1/4"	\$7.50
10" & 1000	1177	3"	1/4"	11.00
13"	341	3 3/4"	3/8"	14.00
14 1/2"	1174	4 3/4"	3/8"	17.00
16"	720	4 3/4"	3/8"	19.00
16/24"	1175	4 3/4"	3/8"	26.00

Taper Attachments

Telescopic and Plain

Taper turning and boring are as easily accomplished as straight turning on lathes equipped with South Bend Taper Attachments. The Taper Attachments are permanently mounted on the lathe carriages, and must be fitted at the factory. Accuracy and smooth operation are assured by their practical design and rugged construction. The swivel bar is graduated in both degrees and taper per foot.

Telescopic Taper Attachments are used only on 10" and larger lathes. A telescopic cross-feed screw eliminates the necessity of disconnecting the cross-feed nut when tapers are machined. The Plain Taper Attachment used on 9" Lathes requires the disconnecting of the cross-feed screw and nut.

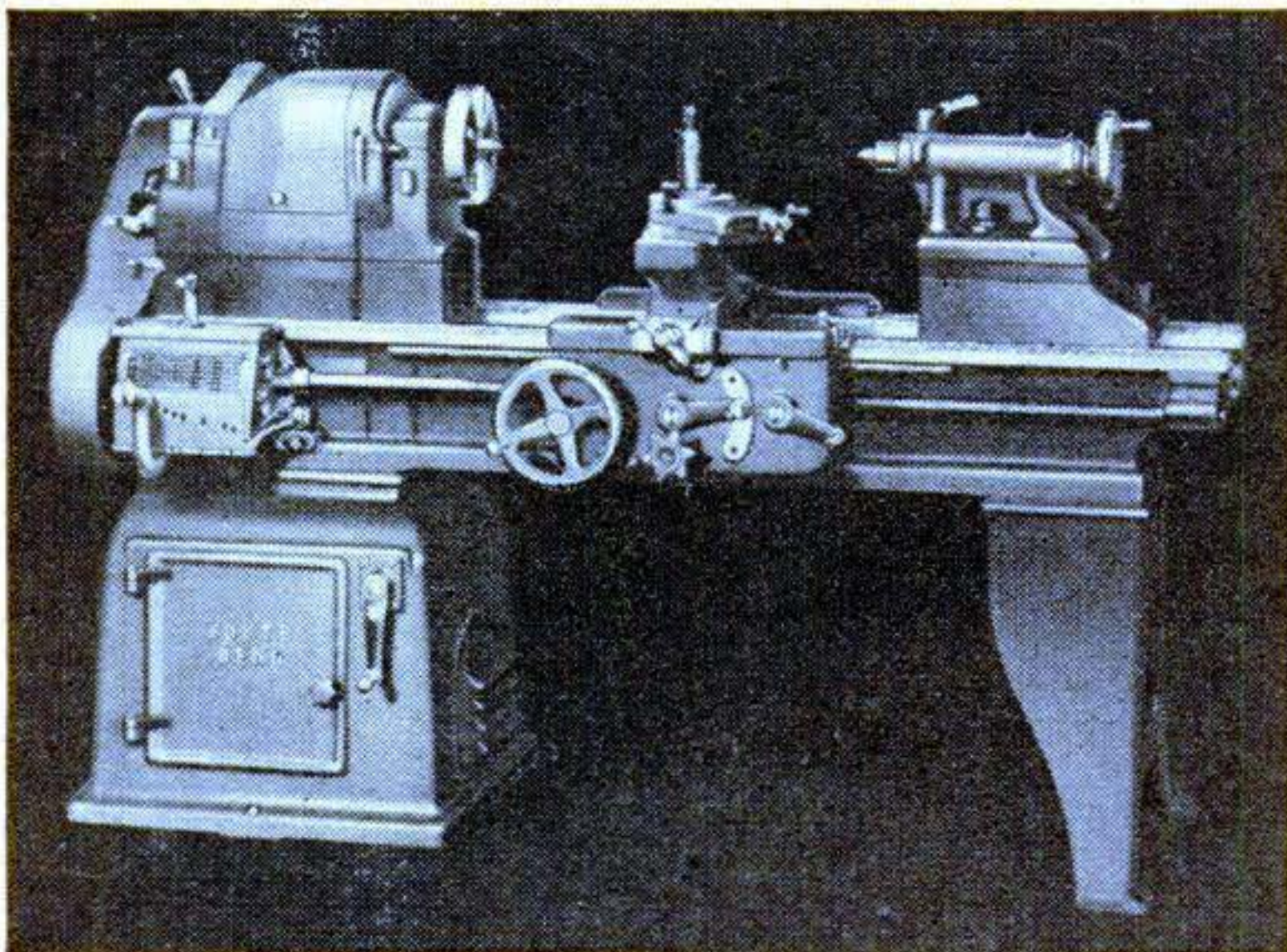


Telescopic Taper Attachment

Size of Lathe	Catalog Number	Max. Length at One Setting	Max. Taper per Foot	Max. Taper in Degrees	Price
9" and 900....	428-W	7"	3 1/2"	16 1/2	\$ 80
10" & 1000....	1545	8 1/2"	3 1/2"	16 1/2	145
13".....	379	9 1/4"	3 1/2"	16 1/2	165
14 1/2".....	399	9 1/4"	3 1/2"	16 1/2	177
16" & 16/24"..	381	11 1/2"	3 1/2"	16 1/2	198

TIME PAYMENT TERMS

When order includes lathe 25% down, balance 12 mos., moderate finance charge (unless federal law requires otherwise)

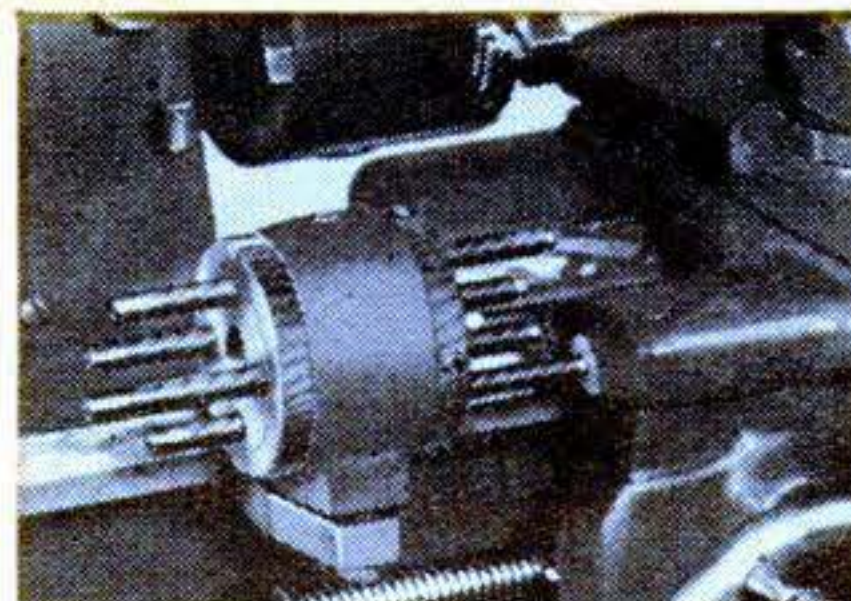


16/24" Quick Change Gear Lathe

This lathe has ample capacity for large, awkward jobs such as wheels, fly wheels, brake drums, etc.; yet, it is not too heavy or cumbersome for efficient operation on small parts. Takes 24 1/4" over bed and 18 3/4" over saddle cross slide. Other specifications are same as for 16" lathes on page 2.

Cat. No. 198-E—16/24" x 8' Quick Change Gear Lathe with 3 ph., 60 cy., 220 v. A.C. motor and drum switch..... \$2028.25

Prices of same lathe with 6', 7', 10', or 12' bed on request.



Four Position Carriage Stop

Used to position cutting tools for repetitive operations. Has four stop screws. Each may be set for a different tool position. Especially useful with a square turret tool block carrying four cutting tools. Clamps to bed on either side of lathe carriage.

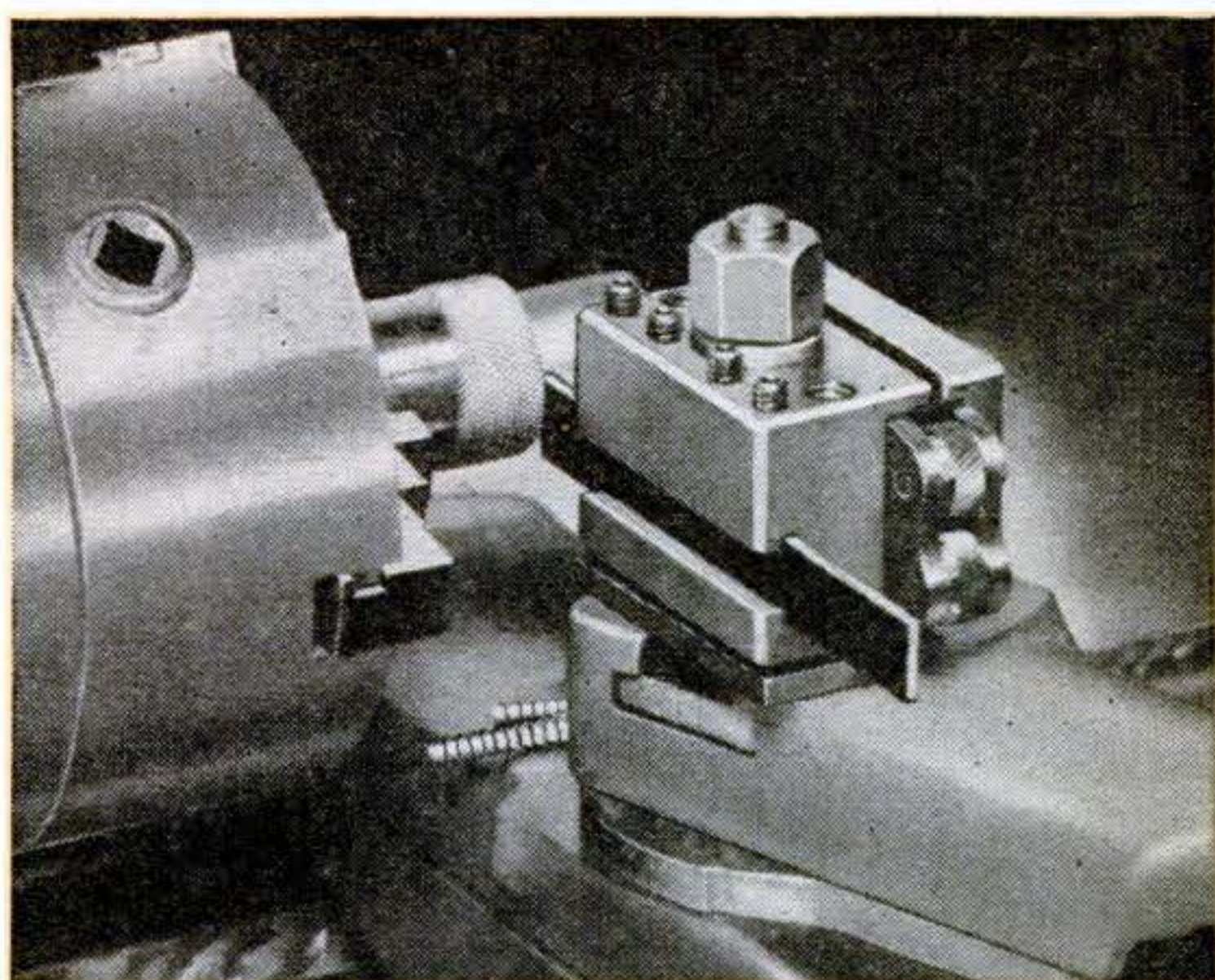
Cat. No.	Size of Lathe	Price
2185-N	9".....	\$18
2185-R	10".....	20
2185-T	13".....	21
2185-F	14 1/2".....	22
2185-H	16", 16/24", 2-H..	23

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

Universal Tool Block

The new Universal Tool Block replaces the conventional tool post and various tool holders ordinarily used for general lathe work. It provides rigid support for turning, boring, threading, and cut-off tool bits. In addition, it is equipped with a self-aligning knurling head. Screw adjustments for tool height are easily made, and they stay put. No re-adjustment is required when replacing tools. This tool block can be adapted to fit other makes of lathes.

Size of Lathe	Cat. No.	Price
9".....	1413-N	\$11.80
10".....	1413-R	12.50
13".....	1413-T	14.50
14 1/2".....	1413-F	16.50
16" & 16/24"	1413-H	17.00



Universal Tool Block

Patent Pending

Square Turret Tool Block

for Double Tool Cross Slide

The turret indexes within .0005", permitting each of four tools to be used in sequence for rough turning, finish turning, facing, boring, cutting-off, or other

Patent Pending

operations as required. A quick-acting lever locks the turret securely in each of the four positions. Rocker adjustment is provided for adjusting height of each tool. For use on the double tool cross slides of South Bend Lathes, but can be adapted for use on other makes.



Patent Pending

Square Turret Tool Block

for Compound Cross Slide

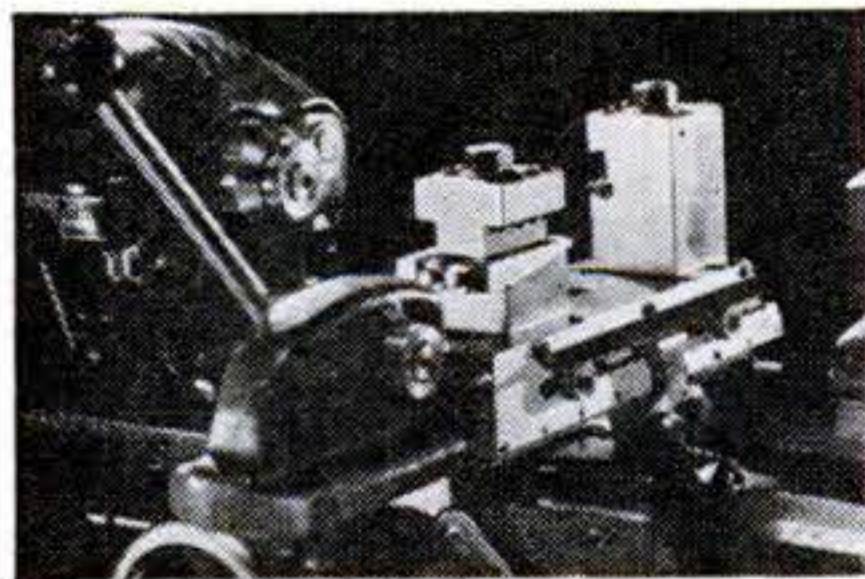
Used on compound cross slides for same purpose as tool block described at left. Turret indexes within .0005" to each of four positions and

locks by means of lever. Rocker adjustments provided for tools. Ruggedly constructed. This tool block is for use on compound rest cross slides of South Bend Lathes but can be adapted for use on other makes.

Tool Blocks for Compound Cross Slides

Size of Lathe	Catalog Number	Size Square	Takes Tools	Price
9" & 900.....	41-ND	3"	3/8" x 3/8"	\$42
10" & 1000.....	41-ND	3"	3/8" x 3/8"	42
16".....	42-ND	4"	5/8" x 5/8"	75

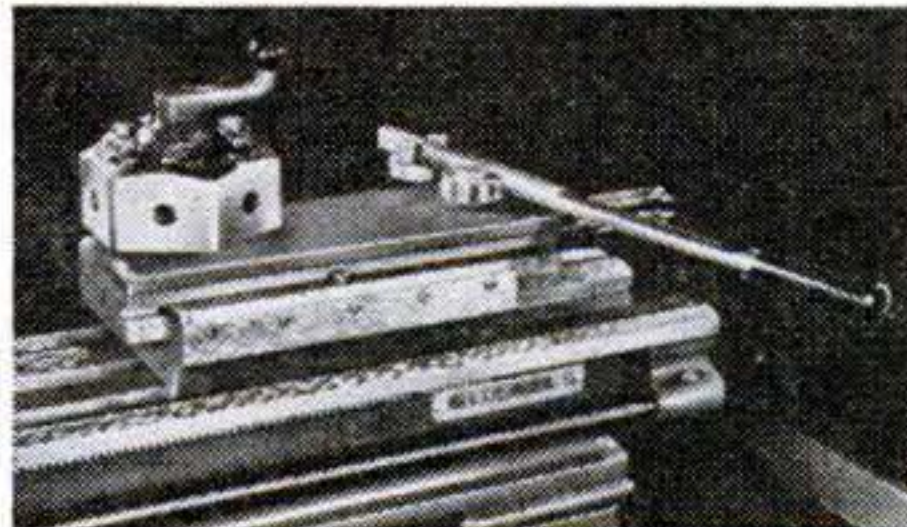
Size of Lathe	Catalog Number	Size Square	Takes Tools	Price
9" & 900.....	40-NC	3"	3/8" x 3/8"	\$48
10" & 1000.....	41-NC	3"	3/8" x 3/8"	48
13".....	43-NC	3"	3/8" x 3/8"	53
14 1/2".....	44-NC	4"	5/8" x 5/8"	75
16" & 16/24".....	42-NC	4"	5/8" x 5/8"	80



Handlever Double Tool Cross Slide

Ideal for increasing production on repetitive operations. Three 7/16" square cutter bits can be used—two in front tool block, one in rear tool block. Mounts on saddle cross slide in place of compound rest. Can be operated by handlever or power cross-feed.

Size of Lathe	Catalog Number	Swing over Slide	Price
9" & 900..	2030-W	3-9/16"	\$79
10" & 1000.	2031	3-9/16"	95



Handlever Bed Turret

Turret head indexes automatically when lever is moved to extreme right. Each turret face has independently adjustable feed stop screw which accurately regulates length of cut. Effective feed of turret slide 4". Turret indexes within .0005" four inches from turret face.

Size of Lathe	Cat. No.	Price
9" & 900.....	1611-W	\$210
10" & 1000...	1612	220
13".....	1613	237

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

SOUTH BEND LATHE ATTACHMENTS

Standard and Safety Lathe Dogs

Lathe dogs should correspond in capacity to the diameter of the work if the work is to be held securely. These lathe dogs are made of heavy malleable iron and are properly designed for maximum strength and long service. The Standard Lathe Dog has square head alloy steel set screw. The Safety Lathe Dog has a headless alloy steel set screw.



Lathe Dogs for 13" and Larger Lathes

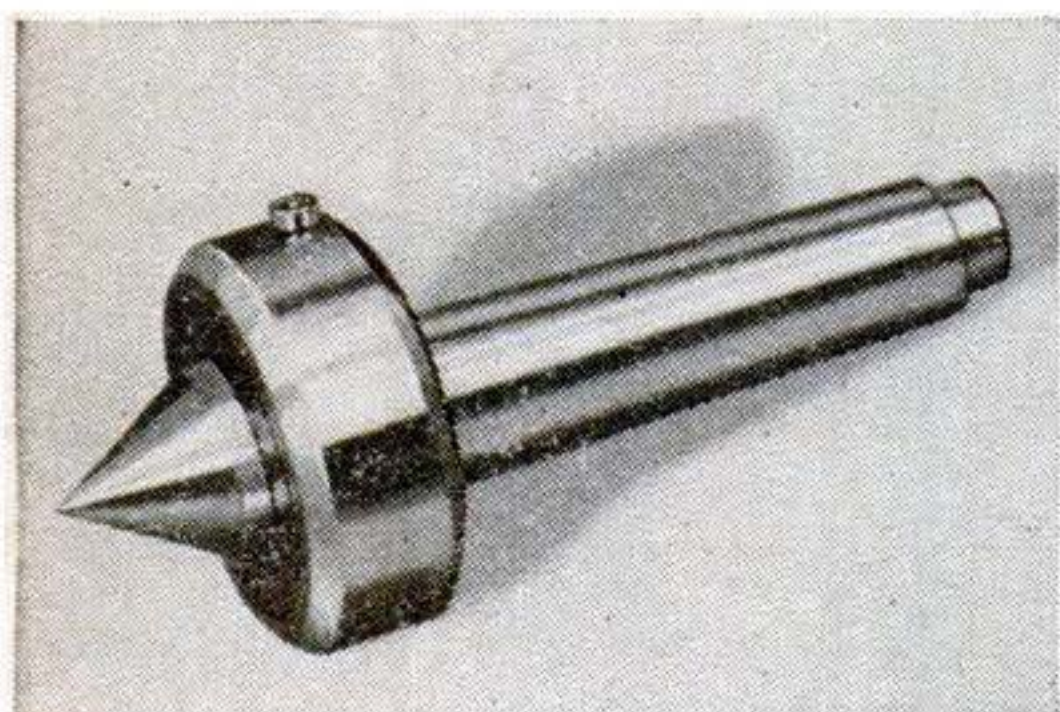
Cap. In.	STANDARD		SAFETY		
	Cat. No.	Price	Cat. No.	Wrench Required	Price
1½	3843	\$0.85	3826	2385	\$0.85
¾	3844	1.00	3827	2386	1.00
1	3845	1.10	3828	2387	1.10
1¼	3846	1.25	3829	2388	1.25
1½	3847	1.50	3830	2389	1.50
1¾	3848	1.65	3831	2389	1.65
2	3849	1.80	3832	2389	1.80
2½	3850	2.05	3833	2390	2.05
3	3851	2.30	3834	2390	2.30
3½	3852	3.15	3835	2390	3.15
4	3853	4.25	3836	2390	4.25

Lathe Dogs for 9" and 10" Lathes

Cap. In.	STANDARD		SAFETY		
	Cat. No.	Price	Cat. No.	Wrench Required	Price
¾	3837	\$0.75	3820	2385	\$0.75
1½	3838	.80	3821	2385	.80
¾	3839	.95	3822	2386	.95
1	3840	1.05	3823	2387	1.05
1¼	3841	1.15	3824	2388	1.15
1½	3842	1.45	3825	2388	1.45

A complete set of lathe dogs is a must in any shop.

Lathe Centers and Drill Pads



Patent Pending

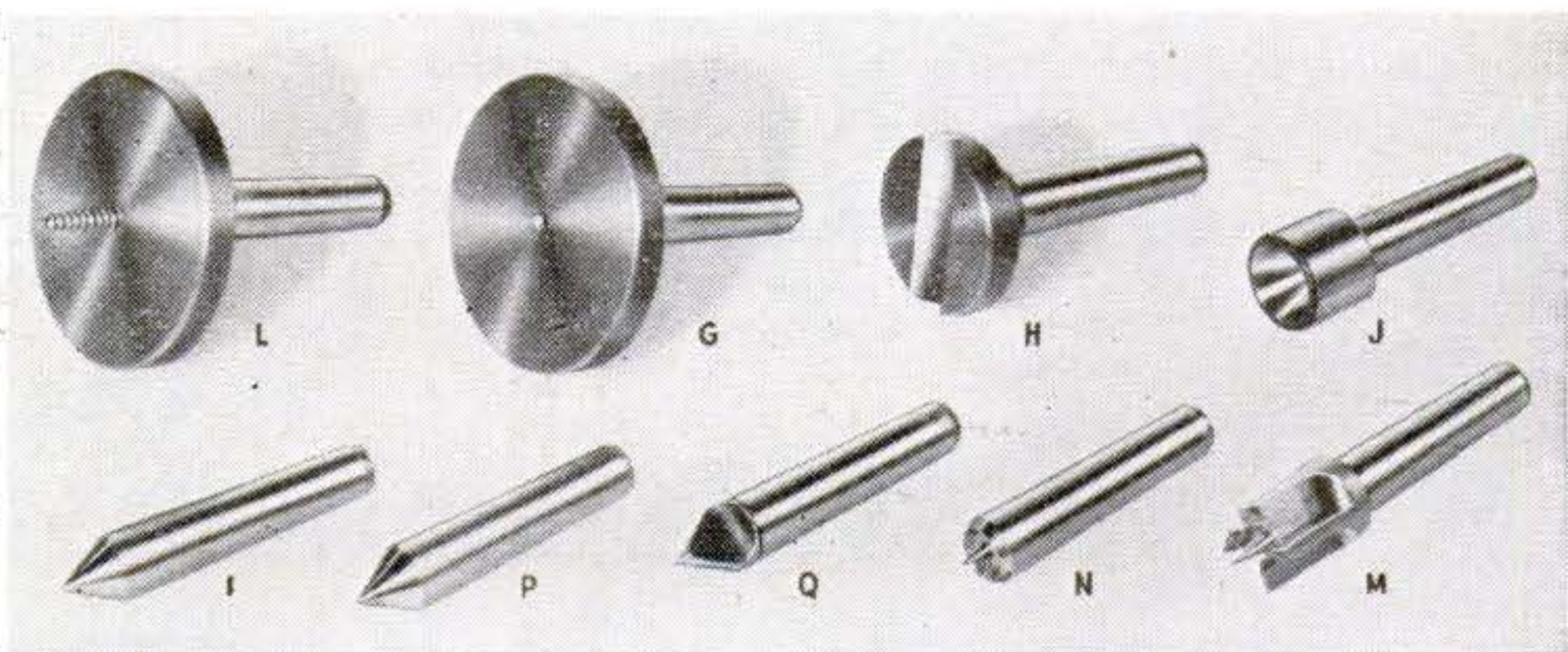
Ball Bearing Live Center

Designed for maximum strength and rigidity, the Ball Bearing Live Center is recommended for high speeds, heavy roughing cuts, etc. 60° point runs in substantial precision ball bearing which is easily replaceable.

Catalog No.	Shank Taper	Price
3900	No. 2	\$13.75
3901	No. 3	16.25

**TIME
PAYMENT
TERMS**

When order includes lathe 25% down, balance 12 mos., moderate finance charge (unless federal law requires otherwise)



L—Screw Center for wood turning. G—Drill Pad to support flat work for drilling. H—Crotch Center supports round work for cross drilling. J—Hollow Center for supporting centerless shafts up to 7/8" dia. I—60° Center for headstock or tailstock spindles P—Carbide Center. Q—Half Center. N—Cup Center. M—Spur Center, for all wood turning operations.

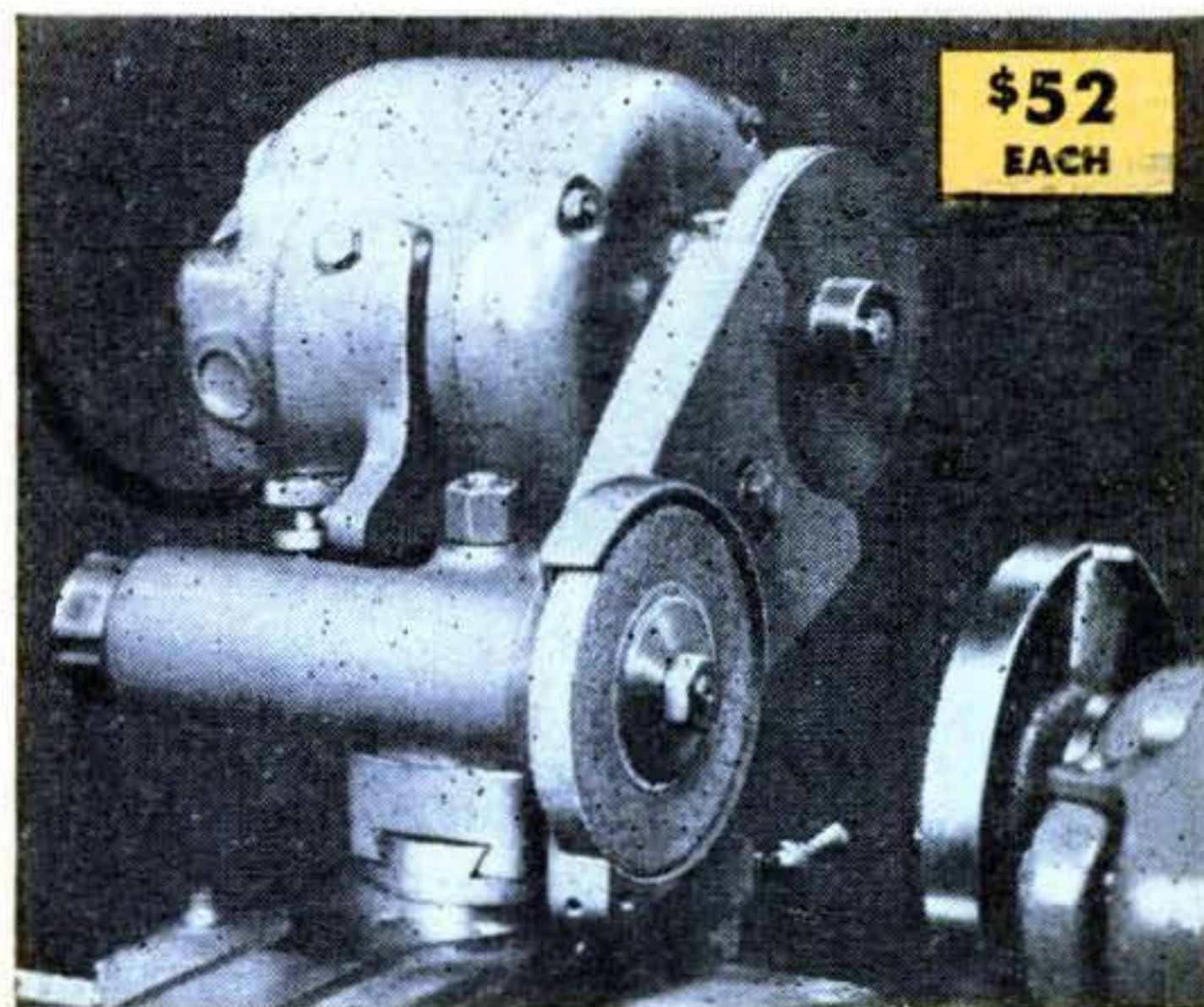
Description	No. 2 Taper for 9" and 10" Lathes		No. 3 Taper for 13", 14½", & 16"	
	Cat. No.	Price	Cat. No.	Price
L—Screw Center.....	731-NR	\$3.15	731-TH	\$3.50
G—Drill Pad.....	727-NR	2.65	727-TH	2.90
H—Crotch Center.....	728-NR	2.65	728-TH	3.50
J—Hollow Center.....	1896-NR	2.15	1896-TH	2.90
I—60° Center.....	726-NR	2.40	726-TH	3.15
P—Carbide Center.....	1889	4.75	1890	8.50
Q—Half Center.....	926-NR	2.40	926-TH	3.15
N—Cup Center.....	733-NR	2.15	733-TH	2.90
M—Spur Center.....	732-NR	3.15	732-TH	3.50

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

Grinding Attachment

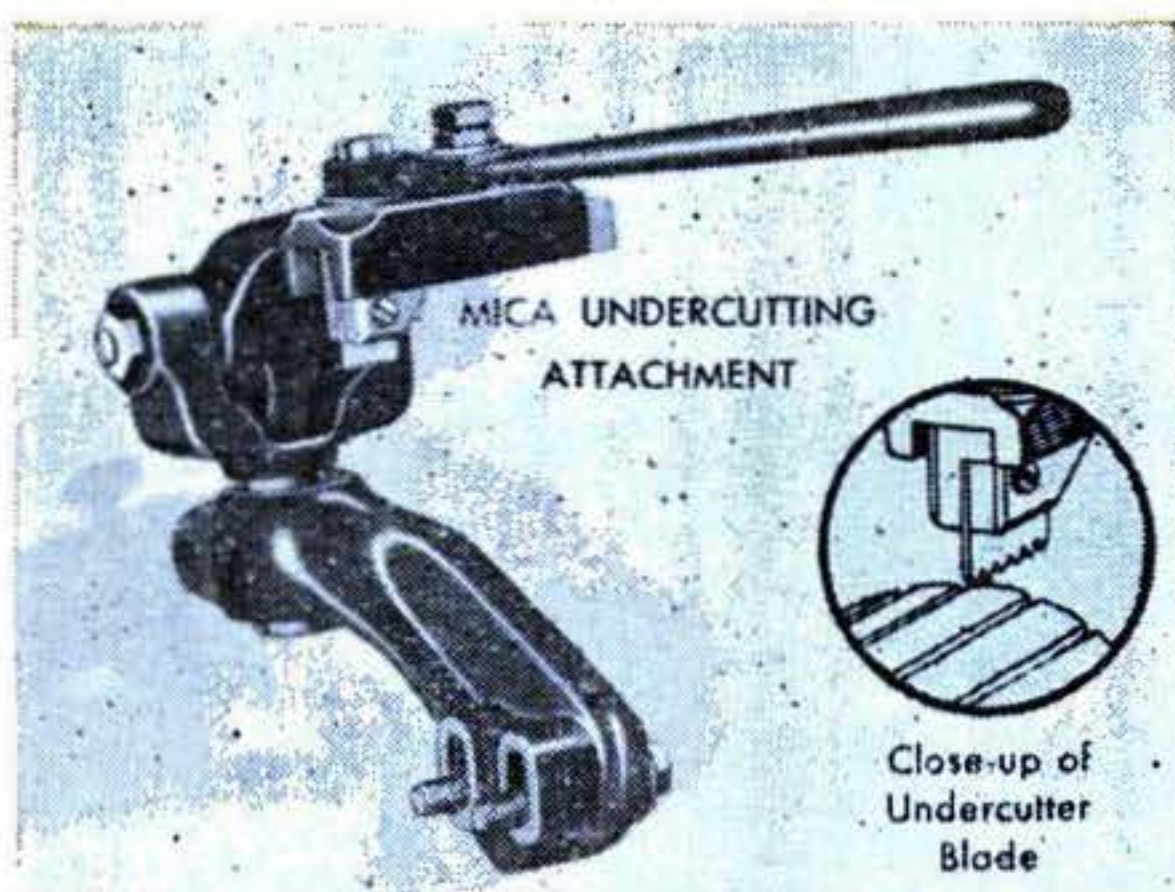
This powerful and efficient grinding attachment is recommended for external grinding. Designed to fit the various sizes of South Bend Lathes, it is easily adaptable for use on milling machines, shapers, planers, or other makes of lathes. The spindle revolves on pre-lubricated, precision ball bearings which are sealed to protect them from damage by dust, grit, and metal particles produced when grinding. Supplied with $\frac{1}{4}$ h.p., 1725 r.p.m., 115 v., 60 cy., 1 ph. motor and 4" x $\frac{1}{2}$ " grinding wheel.

Prices with other motors quoted on request.



External Grinding Attachment

Catalog No.	Size of Lathe	Price
301-BN	9" & Series 900.....	\$52
301-BR	10" & Series 1000.....	52
301-BT	13".....	52
301-BF	14 $\frac{1}{2}$ ".....	52
301-BH	16" & 16/24".....	52



Patented

Mica Undercutting Attachment

Any shop that repairs armatures for motors, generators or starters will have a lot of use for this practical attachment. It attaches to the saddle of the lathe which insures rigidity and alignment. The blade travels parallel to the commutator bars which insures clean, straight cutting. Upper portion is hinged so the blade holder can be swung back so it does not interfere with turning the commutator.

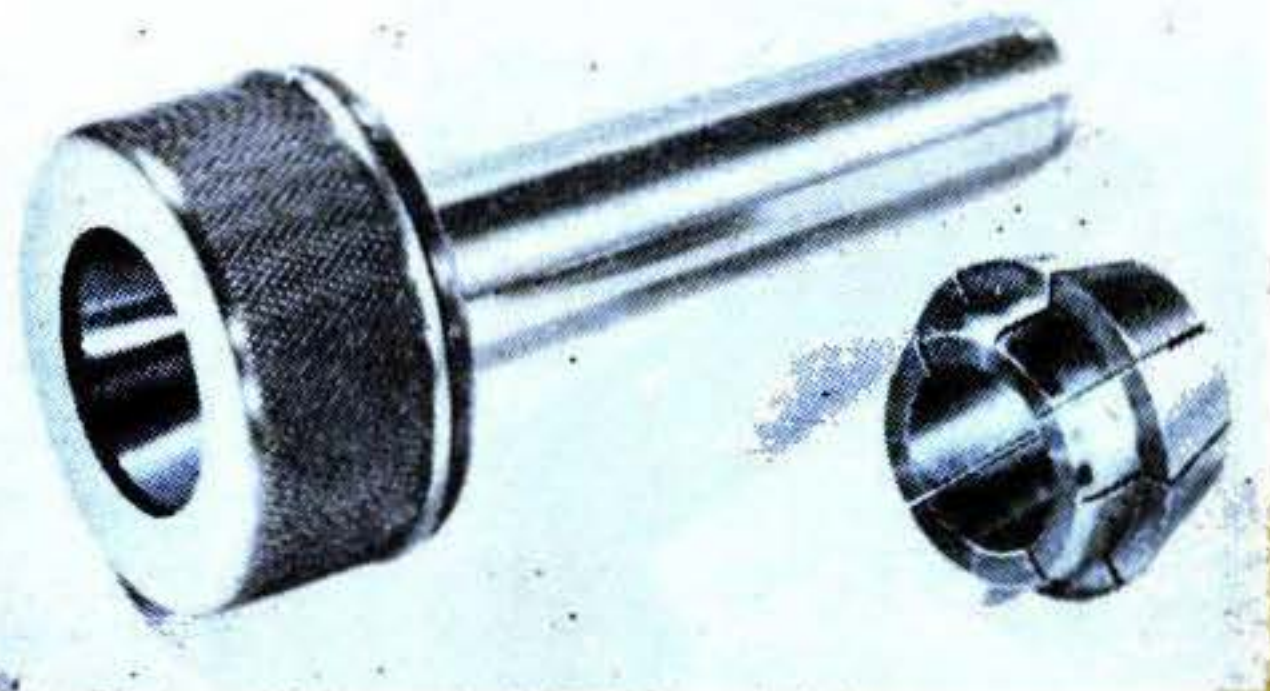
Price includes one blade .020" thick. Extra cutter blades .020" and .015" thick are available as listed below.

Size of Lathe	9"		10"		13"		14½"		16"	
Description	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
Mica Undercutting Attachment.....	675-N	\$19.00	675-R	\$19.00	675-T	\$20.00	675-F	\$21.00	675-H	\$22.00
Extra Blade, .015".....	2028	.20	2028	.20	2028	.20	2028	.20	2028	.20
Extra Blade, .020".....	2029	.30	2029	.30	2029	.30	2029	.30	2029	.30

Adjustable Collet Bushing Chuck

The adjustable collet bushing chuck provides an extremely accurate, but inexpensive equipment for mounting centerless armature shafts, and similar parts, in the lathe. Can be used in either head or tail spindle of lathe. Collets are made of brass, and may be adjusted for either running fit or driving fit on shaft.

Description	Cat. No.	Shank	Price
Adjustable Collet Bushing Chuck Only.....	1615-NR	No. 2	\$6.60
	1615-TH	No. 3	7.15
Adjustable Collet Bushing Chuck with set of 3 collets, 9/16", 5/8" and .637" capacity for popular armatures.....	1608-NR	No. 2	9.45
	1608-TH	No. 3	9.95



Cat. No. 1659, Extra Collets for round work, any capacity $\frac{1}{4}$ " to 1" round by 16ths, price each \$1.10.

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

NOVEMBER 1948 SB15

Accessories for South Bend Lathes

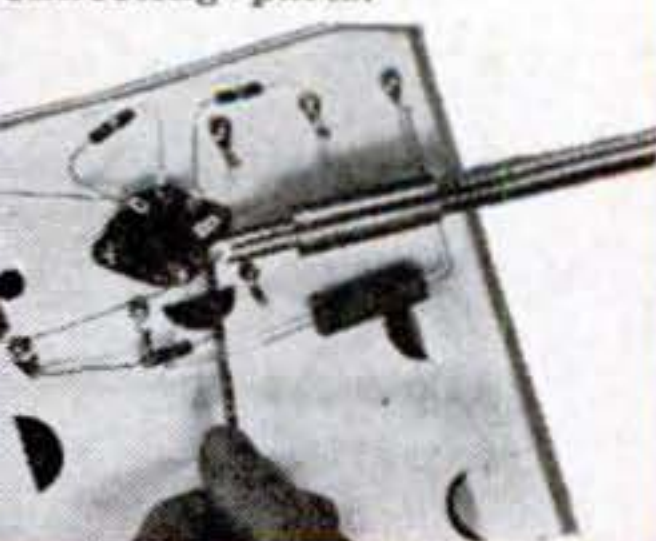
DESCRIPTION	9"	10"	13"	14½"	16"
Bench, angle iron with 26" x 60" wood top, no drawers...	\$32.75	\$.....	\$.....	\$.....	\$.....
Bench Drawer, 20" x 14" x 3¾", for above bench.....	6.25	.....	.....	.....	.....
Bench, tubular steel with 27" x 51½" top and six drawers..	135.00	.....	.....	.....	.....
Center Knock-out Bar, with knurled handle and brass tip..	2.65	3.25*	4.75*	4.75*	4.75
Chuck, face plate type, with four jaws.....	15.75	20.00*	.....	.....	.....
Chuck, ⅛" to ⅝" Hollow Threaded for holding auto. valves.	15.00	.....	.....	.....	.....
Chuck, ⅜" to ¾" Hollow Threaded for holding auto. valves.	18.00	.....	.....	.....	.....
Chuck, 6" Independent 4-jaw, medium pattern.....	32.50	38.50*	.....	.....	.....
Chuck, 6" Independent 4-jaw, regular pattern.....	60.00	66.00*	66.00*	.....	.....
Chuck, 7½" Independent 4-jaw regular pattern.....	.....	73.00*	73.00*	74.00*	74.00
Chuck, 9" Independent 4-jaw, regular pattern.....	.....	.....	80.00*	81.00*	81.00
Chuck, 10" Independent 4-jaw, regular pattern.....	.....	.....	.....	93.00*	93.00
Chuck, 12" Independent 4-jaw, regular pattern.....	.....	.....	.....	.....	107.00
Chuck, 5" Universal 3-jaw med. pattern, with two sets jaws.	47.22	53.22*	.....	.....	.....
Chuck, 5" Universal 3-jaw, reg. pattern, with two sets jaws.	75.00	81.00*	81.00*	82.00*	82.00
Chuck, 6" Universal 3-jaw, reg. pattern, with two sets jaws.	.....	84.00*	84.00*	85.00*	85.00
Chuck, 7½" Universal 3-jaw, reg. pattern, with two sets jaws	.....	.....	96.00*	97.00*	97.00
Chuck, 9" Universal 3-jaw, reg. pattern, with two sets jaws..	.....	.....	.....	.....	125.00
Chuck, 0 to ⅜" Jacobs Drill, with No. 2 Morse Taper arbor..	6.40	6.40	.....	.....	.....
Chuck, 0 to ½" Jacobs Drill, with No. 2 Morse Taper arbor..	7.74	7.74	.....	.....	.....
Chuck, ⅜" to ¾" Jacobs Drill, with No. 2 Morse Taper arbor	12.90	12.90	.....	.....	.....
Chuck, ⅜" to 1" Jacobs Drill, with No. 2 Morse Taper arbor.	20.90	20.90	.....	.....	.....
Chuck, 0 to ⅜" Jacobs Drill, with No. 3 Morse Taper arbor..	.....	.....	6.85	6.85	6.85
Chuck, 0 to ½" Jacobs Drill, with No. 3 Morse Taper arbor..	.....	.....	8.19	8.19	8.19
Chuck, ⅜" to ¾" Jacobs Drill, with No. 3 Morse Taper arbor	.....	.....	13.35	13.35	13.35
Chuck, ⅜" to 1" Jacobs Drill, with No. 3 Morse Taper arbor.	.....	.....	21.35	21.35	21.35
Cutter Bits, high speed steel, to fit turning tool holders....	.25	.25	.35	.55	.55
Diamond Dresser and holder for truing grinding wheels...	13.25	13.25	14.25	14.25	15.25
Die Holder with No. 2 M. T. shank, for 1½" round dies....	4.25	4.25	.....	.....	.....
Die Holder with No. 3 M. T. shank, for 1½" round dies....	.....	.....	4.75	4.75	4.75
Double Tool Cross Slide, screw feed type.....	.....	.....	.....	.....	131.00
Gauge, for grinding lathe tool cutter bits.....	.50	.50	.50	.50	.50
Metric Transposing attachment, Quick Change Gear Lathe.	11.00	42.00	47.00	53.00	58.00
Metric Transposing attach., Standard Change Gear Lathe.	13.00	.....	.....	.....	.....
Reamer and cutter grinding stops, for use with grind. attach.	16.00	17.00	19.00	21.00	21.00
Tailstock, handlever type, in addition to regular T. S.	84.00	100.00	.....	.....	.....
Tailstock, handlever type, in lieu of regular T. S.	63.00	74.00	.....	.....	.....
Tool, boring, style "B" with sleeve bar and two cutter bits..	6.53	6.53	7.73	10.20	10.20
Tool, boring, style "D" with solid boring bar.....	4.13	4.13	4.80	6.00	6.00
Tool, left hand turning, with cutter bit and wrench.....	1.67	3.80	4.33	5.33	5.33
Tool, right hand turning, with cutter bit and wrench.....	1.67	3.80	4.33	5.33	5.33
Tool, straight shank turning, with cutter bit and wrench...	1.67	3.80	4.33	5.33	5.33
Tool, knurling, with medium diamond knurls.....	4.00	7.53	9.00	10.66	10.66
Tool, left hand cut-off, with cutter blade and wrench.....	.....	3.80	4.80	6.00	6.00
Tool, right hand cut-off, with cutter blade and wrench.....	2.00	3.80	4.80	6.00	6.00
Tool, straight shank cut-off, with cutter blade and wrench..	2.00	3.80	4.80	6.00	6.00
Tool, threading, with 60° formed cutter.....	3.33	5.53	6.67	8.53	8.53
Turret, turnstyle operated, for lathe bed.....	.....	.....	.....	.....	525.00

*These prices are for 1" Collet Lathes. Prices for regular lathes are slightly less.

SOUTH BEND LATHE WORKS, 524 E. Madison Street, South Bend 22, Indiana, U.S.A.

I Send You BIG KITS of RADIO PARTS

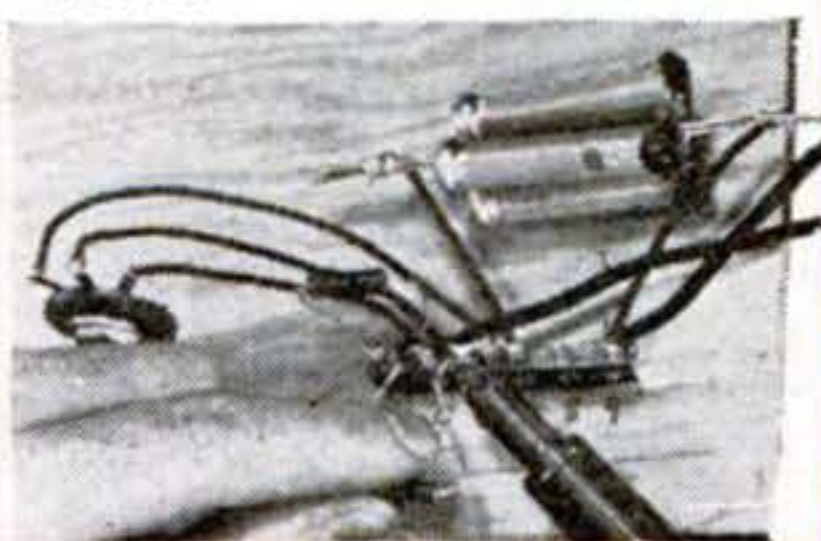
PRACTICE Radio. Soldering Equipment. Radio Parts I send you. Get actual experience mounting connecting parts.



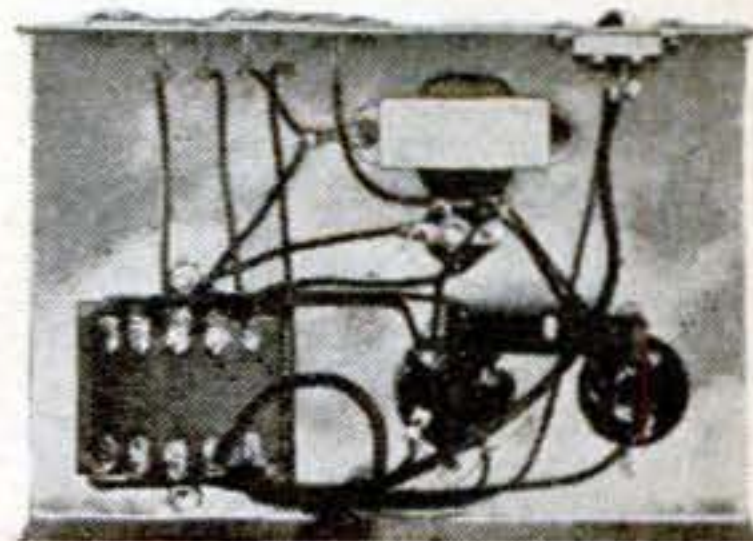
YOU BUILD this Tester with parts N. R. I. sends early in course. Soon helps you fix neighbors' Radios and **EARN EXTRA MONEY** in spare time.



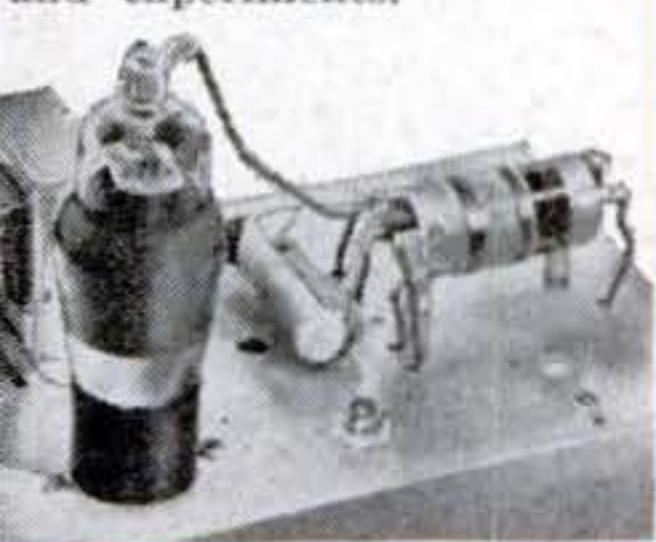
YOU TEST Radio Circuits like this built with parts I send. Build special circuits; learn how to locate and repair circuit defects.



YOU BUILD Vacuum Tube Power Pack; make changes which give you experience with packs of many kinds. Learn how to correct Power Pack troubles.



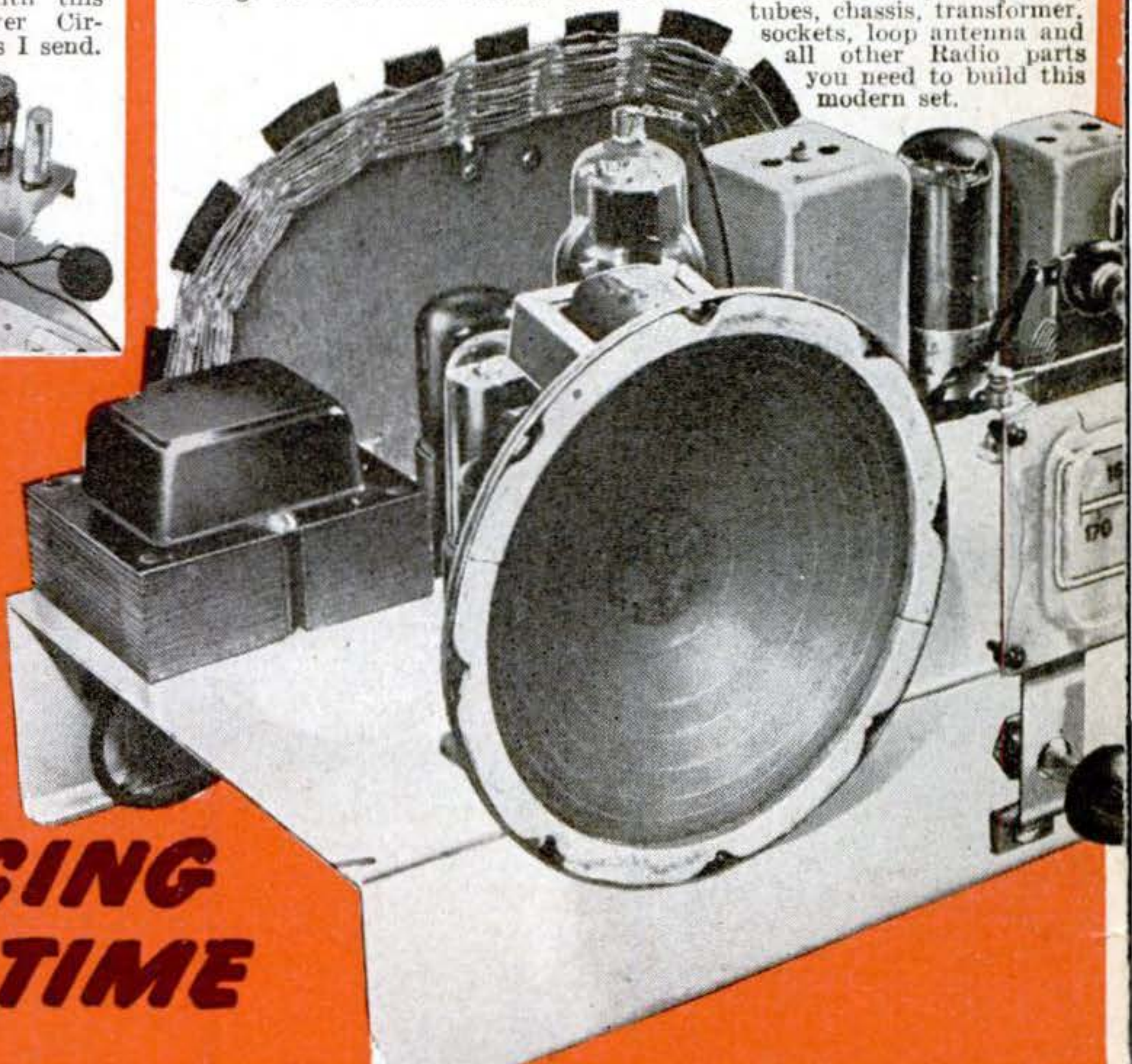
BUILD this A. M. Signal Generator for more valuable experience. It provides amplitude-modulated signals for many experiments.



YOU PRACTICE FM (Frequency Modulation) experiments, get more experience with this Superheterodyne Receiver Circuit you build with parts I send.



YOU GET PRACTICAL EXPERIENCE. As part of your training, you build this powerful Superheterodyne Radio Receiver. It brings in local and distant stations. N. R. I. sends you speaker, tubes, chassis, transformer, sockets, loop antenna and all other Radio parts you need to build this modern set.



LEARN RADIO

BY PRACTICING IN SPARE TIME



J. E. SMITH, President
National Radio Institute

Want a good-pay job in the fast-growing Radio and Television Industries? Want to be boss of your own money-making Radio shop? Now is your opportunity! I've trained hundreds of men to be Radio technicians, *men with no previous experience* . . .

and I can do the same for you. My unique train-at-home method gives you practical experience with **BIG KITS OF PARTS** I send. All equipment

yours to keep. You also learn Radio and Television principles from step-by-step, easy-to-grasp illustrated lessons.

Make EXTRA MONEY In Spare Time

The day you enroll, I send you **EXTRA MONEY** booklets. Use your *know-how* to make **EXTRA MONEY** fixing neighbors' Radios in spare time.

From here, it's a short step to your own Radio shop or a good-pay Radio job.

N. R. I. Trained Men Face Bright Future

Think of money-making opportunities in Police, Aviation, Marine Radio, Broadcasting, Radio Manufacturing, Radio Repairing, Public Address Work, etc. And think of even greater opportunities in fast-growing Television, FM and Electronics.

Get Actual Lesson and Book Free

Act NOW! Mail post card for my special **DOUBLE FREE OFFER**. Get actual lesson, "GETTING ACQUAINTED WITH RECEIVER SERVICING," absolutely free. Discloses short-cuts used by Radio repair men to check and repair Radios. Over 80 pictures and diagrams! Send now and also get my 64-page book, "HOW TO BE A SUCCESS IN RADIO—TELEVISION—ELECTRONICS." See how quickly, easily you can get started. But send NOW! J. E. SMITH, President, Dept. SMP3, National Radio Institute, Pioneer Home Study Radio School, Washington 9, D. C.

**I WILL
TRAIN YOU
AT HOME**

**MY COURSE
INCLUDES
TELEVISION
ELECTRONICS**

GET 64 PAGE BOOK AND ACTUAL LESSON BOTH FREE! MAIL NOW!

When safety's a must...it's **PRESTONE** ANTI-FREEZE



SAFETY'S A MUST WITH FIREMEN

... Fire Chief William Lemon, of Mamaroneck, N. Y., says, "My car has got to be safe from freeze-ups. I know 'Prestone' anti-freeze will *keep* it safe — and prevent rust as well." You can depend on "Prestone" anti-freeze—America's Number One brand.



SAFETY'S A MUST WITH AMBULANCE DRIVERS...

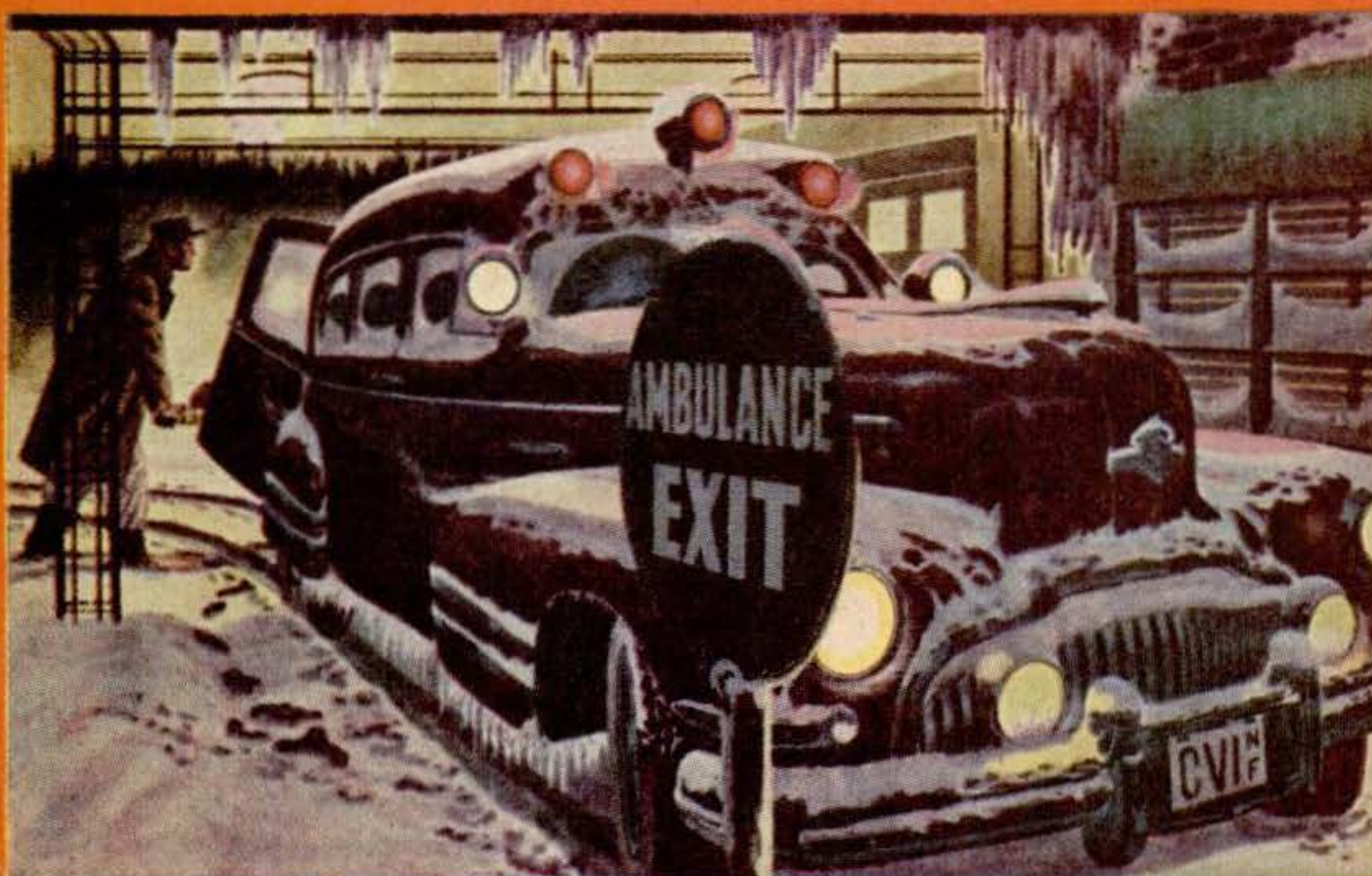
"You can't race illness with a cracked engine," says Ambulance Driver James Sweeney, of St. George, Staten Island, N. Y. "One shot of 'Prestone' anti-freeze a year keeps my 'bus' safe, regardless of sharp weather changes."



SAFETY'S A MUST WITH POLICEMEN...

"I know from experience that 'Prestone' anti-freeze never lets you down," says Police Chief Fred A. Roff, of Morristown, N. J. Give your car the same safe protection that policemen, ambulance drivers, and firemen over the country give theirs.

Give your car the same safe protection



NO RUST!

NO FOAM!

NO FREEZE!

NO FAILURE!

"Prestone" anti-freeze is America's Number One brand. Year after year more motorists depend on it than all other brands of all-winter antifreezes combined.

GUARANTEED!

Ask your dealer to show you the guarantee. It's your assurance of all-winter safe protection.

\$3.50
PER GAL.



PRESTONE

TRADE-MARK

Anti-Freeze

The registered trade-marks "Prestone" and "Eveready" distinguish products of
NATIONAL CARBON COMPANY, INC.

30 East 42nd Street, New York 17, N. Y. **UCC** Unit of Union Carbide and Carbon Corporation